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FUEL OIL-BURNING VESSELS.

The annual report of Supervising Steamboat Inspector General Uhler, has provoked a great deal of adverse criticism in shipping circles of San Francisco. In his report, General Uhler states that the use of crude petroleum as a fuel on passenger steamships should be prohibited if it will flash at less than 140 degrees.

Shipping men of experience claim that Uhler is unreasonable in his professional zeal to serve the traveling public. It is declared that the compulsory adoption of such a high flash test as he recommends would practically put an end to the use of fuel oil on all passenger steamers; for the test would be as high, if not higher, than that exacted in the case of refined petroleum used as an illuminant.

Besides, it is claimed, crude petroleum would have to be put through a process of refining to expel the volatile oils it contains and which add to its value as a fuel, and thus make it, probably too costly for steam making purposes. Again, all naphtha and gasoline launches, of which many hundreds are now employed as passenger carriers, would have to go out of business, as the fuels they use are the lighter by-products obtained in the process of petroleum refining, and which explodes at a low temperature. Passenger steamships sailing in and out of San Francisco have used crude petroleum as fuel for years with immunity from danger or risk, as the oil tanks are well ventilated and kept at a uniform temperature. These fuel oil-burning steamships are probably more secure, shippers assert, against the possibility of fire than those vessels which continue to depend upon coal, as spontaneous combustion in the bunkers of the latter is by no means an unusual occurrence.

About two years ago the navy department made a thorough investigation into the use of crude petroleum on some of the Pacific ocean liners, which resulted in the recommendation of its adoption on some of the smaller naval vessels, and in the most positive endorsement of its safety and economy.

It is pointed out that the British Admiralty after several years' test with specially equipped oil-burning furnaces on some of its warships has decided to adopt crude petroleum as fuel for the British navy, and the vessels now under construction are being outfitted as fuel oil-burners.

In San Francisco shipping circles it is claimed that the English Admiralty would certainly not have adopted crude petroleum as fuel for its ships if there had been any such risk attending its use as the supervising inspector general suggests in the high flash test recommendation.

BATTLESHIP KENTUCKY RAMMED.

While five of the big battleships of the North Atlantic squadron under Rear-Admiral Evans were steaming out to sea on Saturday last, from New York harbor, the Kearsarge and Kentucky went aground, and the Alabama, the fourth in line, struck the Kentucky on the starboard quarter tearing a hole in her own port-bow and seriously damaging the Kentucky. The Kentucky was ordered to the navy yard for repairs, but the other battleships continued on their journey. Officers of some of the ocean liners, when they heard of the grounding of the Kearsarge and Kentucky, called attention to the fact that although they passed in and out of New York harbor by its present main ship channel oftener and with greater regularity than any man-of-war, they never do so without a pilot. One British officer, with pardonable pride, in comparing the handling of British and American war ships, recalled the recent visit of Prince Louis' squadron to New York. Without a pilot on board any of the ships they entered and left the harbor at a speed of something like 18 knots and over, maintaining perfect distance and single column formation without a mishap, showing that their officers had knowledge of the depth of water in the channels to a remarkably accurate degree.

INSPECTION SERVICE FOR SAILING VESSELS.

A bill has been introduced in the house of representatives in Washington, that all vessels, other than steam vessels, sailing in the American coastwise service shall be placed under government inspection similar to the steamboat inspection service. It is represented that there is a tendency to underman and overload sailing vessels and barges, especially in the winter time, and the bill proposes to provide for the safety of coasting vessels and barges and their crews, by establishing a load line, increasing the number of men constituting the crew and requiring gasoline or steam engines to be installed for such purposes as hoisting sails, etc. The bill also states that the government inspection service for schooners and barges shall have power to designate a load water mark for vessels when first built, and for those now or hereafter under the American flag. The lowering of this load mark shall be three inches every third year, beginning from the time such vessel is seven years old and continuing until it is twenty-two years old, when the service shall have power to determine the requirements which will justify her further seaworthiness.

The Harlan & Hollingsworth Co., Wilmington, Del., have just closed a contract for the construction of a steamer for the Merritt & Chapman Wrecking Co. The vessel will be 200 ft. long, 33 ft. beam and 14 ft. deep. Her engines will be 18, 30 and 50 in. cylinder diameters by 30 in. stroke, supplied with steam from two Scotch boilers. Horace See is the designer.

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SCOUT VESSELS FOR THE UNITED STATES NAVY.

BY LIEUT. H. C. DINGER.

In the last appropriation act for the navy, congress included an appropriation for three scout vessels of about 3,700 tons displacement. These are the first vessels in our navy to be especially designed for this important work, and in this appropriation of congress may be seen a practice, which is to be hoped will continue, of confining appropriations to vessels of purely military and tactical value.

In the majority of our cruisers and large gunboats we have nondescript vessels not properly qualified for any active military duty. They are too slow for scouting while at the same time their armament is too weak for the line of battle. Their lack of coal endurance and habitality will even make them not well adapted for blockade purposes. To continue to repair a great many of these vessels is only throwing good money after bad; and the most profitable use some such vessels could be put to would be to use them as targets in the manner of the Bellisle experiments. Others might be kept in a state of reserve on the assumption that they might be of some possible use in time of war, and that their presence might lessen the tendency of buying (on the inception of a war) any vessel that influential personages might have to sell.

Even among our vessels very recently completed we have ten vessels of comparatively little military value. These are the four new monitors and the six cruisers of the Denver type. It is, therefore, a happy omen to see a naval bill passed which calls only for vessels that add to the essential military value of the navy. In this we may see the good effect of having questions, such as this, passed upon by the general board of the navy and not allowing the influence of sentimental, local or political conditions to affect the types of vessels on which the defense of the country depends. This apparent giving way to the influence of local, traditional or sentimental conditions has hitherto been one grave defect in our appropriations for the increase of the navy, and no doubt this will continue until an authoritative body capable of thoroughly investigating and knowing naval needs is delegated to outline a building policy that will enable the government to get its proper value received in fighting efficiency from the money appropriated.

Scouting is special work, distinct from the real fighting work, and therefore vessels must be designed especially for this purpose. This will call for a vessel in which all defensive and offensive attributes have given way to scouting features.

The prime features of a scout are speed, endurance, reliability.

SPEED.

The scout must have a sea speed superior to any heavily armed vessel in order that she may be able to elude capture. The speediest heavily armed vessels are now built for 24 knots. Hence the lower limit for the speed of the scouts will be about 25 knots. The scouts must be of sufficient size so that ordinary rough weather will not materially affect the speed or habitability. For these reasons they should not be of less than 3,000 tons displacement.

ENDURANCE.

Their steaming radius should be at least 2,000 miles at full power. This would enable these vessels to cross the Atlantic at full speed. In order to get these requirements —speed 25 knots, endurance at full speed 2,000 miles, and displacement something over 3,000 tons.—Let us first assume that the vessel has a displacement of 3,000 tons. The necessary horsepower for a speed of 25 knots will be about 15,000. Assuming that the coal consumption is 2 pounds per I. H. P. per hour, the daily coal consumption is 319 tons.

At 25 knots the daily run is 600 miles. The coal necessary for 2,000 miles is then 1,050 tons. It will however be practically impossible to build the hull and machinery with the remaining 1,950 tons. The machinery weights will require about 800 tons, so that only 1,150 would be left for the hull and other equipment including armament. As the hull must be built strong enough for hard service, weight for this purpose cannot be cut down too much.

An increase of 600 tons will enable the hull and hull fittings to be made strong and adequate, and will provide for a small armament. This brings the displacement up to 3,600 tons. With this increased displacement an increased power is necessary, and likewise an increase in coal capacity. If the coal capacity is allowed to go up to 1,200 tons, and as much as 900 tons allowed to machinery, engineering stores and reserve feed water, we have a total of 1,700 hull plus 900 machinery plus 1,200 coal = 3,700 tons which should be the minimum displacement. An addition of 300 tons for any other added weights in armament, ammunition and fittings brings the displacement up to 4,000 tons, which should allow necessary weight for the essential features of a scout with a sustained speed of 25 knots, an endurance of 2,000 miles at full speed and about 10,000 miles at 10 knots.

RELIABILITY.

Reliability is to be obtained by aiming to produce a vessel to meet the actual conditions of continued service in the best possible way, and not by aiming to produce certain trial speed results or paper attributes in order that vessels may compare favorably with vessels on a foreign navy list, the condition and details of which officials of our navy and our ship builders may know next to nothing of.

Trial results and paper characteristics mislead only ourselves and the lessons Russia has had an opportunity of forcibly learning in her present war ought to convince those in control of the characteistics and design of our vessels that fiat ships will, when war time comes, depreciate as much as fiat money.

To secure reliability the essential features of the vessel must be allotted sufficient space and weight to allow a thoroughly good design and arrangement to be used.

ARMAMENT.

The armament of these vessels should be only sufficient to overcome torpedo craft or a small gunboat or to capture a merchant vessel.

Nothing heavier than two 5-inch guns and a few guns of smaller caliber would seem to be advisable. A heavier battery will cause the addition of considerable weight to the structure of the vessel to secure the necessary stiffness and to accommodate the ammunition, and at the same time a serious encroachment upon the space necessary for machinery and coal.

The fitting of torpedo tubes especially under water tubes on a vessel of this class may even be of questionable utility owing to the comparatively large amount of space and the weight they will require.

Scouts must be able to steam for long distances at high speeds and occasions for the effective use of their batteries will in all probability be few. They are not made to fight a battle, and an attempt to load them with anything more than a very light battery will simply be a step toward adding these vessels to the class of nondescripts which are now overburdening the navy list.

The original battery of the scouts was twelve 3-inch guns. This has been changed to allow two 5-inch guns and a smaller number of 3-inch guns.

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HABITABILITY.

Special provision must be made to secure proper living quarters for the personnel. The condition and state of such quarters while under forced draft should be considered in its hygienic relations. The endurance of the vessel and her efficiency as a scout depends upon the endurance of her personnel. Suitable living quarters that will provide ample sleeping accommodations and a well ventilated and dry resting place in rough weather will serve to maintain the crew in good physical condition and contented state of mind, the effect of which upon the endurance and the capabilities of the vessel will be worthy of thorough consideration.

Good living quarters with ample room for the crew are provided by providing a raised forecastle deck which extends aft to the forward smoke stack and by having the whole gun deck fore and aft available for living quarters, The high free board, 34 feet forward and 22 feet aft, will serve to make these quarters dry and airy.

STRUCTURAL STRENGTH.

Good structural strength with least weight is to be obtained by care in locating bulkheads and intelligent use of pillars, beams, ties and stiffeners. The bulkheads and decks should be continuous and as few holes as possible for communication should be cut.

Special care must be taken to secure proper solid foundations for the engines and auxiliaries so that their weights are well distributed, and that excessive vibrations are avoided. In order to better distribute the weights the engines are placed one abaft the other. This does not allow of as handy an engine arrangement, but in this case handiness in arrangement must be sacrificed to obtain better structural strength and distribution of weights.

FINENESS OF HULL.

For high speed vessels the form of hull is a very material factor in governing the power necessary to attain the speed. At ordinary speed, below 13 knots, the effect of wave making resistance is a relatively small portion of the total resistance, but as speed increases the wave making resistance which depends on the form of hull increases very rapidly so that at speeds of 25 knots it may amount to one half of the total resistance.

The importance of having lines of hull adapted to the speed is of such importance that numerous models have to be tried. The lines which show the best propulsive efficiency may however not be those well suited to the proper location of the machinery and propellers so that alterations from best form are sometimes necessary in order that engines and boilers may be located to better advantage.

The lines must also be adapted to secure necessary stability and the above water part of the vessel must be such that the action of the waves in affecting the speed and steadiness of the vessel should be a minimum.

MACHINERY.

This must be thoroughly reliable, and therefore it will not be wise to crowd into the space all the horsepower possible with the result of a very unhandy installation and rapid decay due to crowded condition. Duplication and complication should be avoided, and in order to reduce the work of the personnel the machinery should be capable of being easily taken care of.

The facility of overhaul and the reliability of all appurtenances put on board must be the cardinal feature in developing the design.

ENGINES.

To secure engines for these vessels which will at the same time be light, thoroughly reliable and capable of being installed in the limited space available, is a problem of no little magnitude. These considerations have brought forth the problem of the turbine engines. The turbine will be better adapted for installation in the scouts than perhaps on any other type of naval vessel.

In order that a comparison of the best possible installation may be drawn, the present plan is to install reciprocating engines in one vessel and Parsons and Curtis turbines in the other two. The turbine installation will at once bring forth the question of multiple screws. From a tactical standpoint the best arrangement for the turbines seems to be three screws each operated by a separate and independent turbine.

With two screws it will be very difficult to get the necessary propeller surface to handle 8,000 I. H. P., and two propellers on a single shaft does not lend itself to good propulsive efficiency. Another advantage of the three screw arrangement is that the wing screws only would need to be arranged for backing, and the center one could be used for great speed only. In this way very good propulsive efficiency is possible, and there is not such a great risk of lack of economy at low power. The plan decided upon is one vessel Parsons turbine 4 screws, one vessel Curtis turbine two screws.

With reciprocating engines in the scouts no steam jackets are to be fitted owing to necessity for lightness and the somewhat questionable gain in economy due to jackets, and also difficulty sometimes experienced in cutting cylinders due to the inefficient cylinder lubrication while jackets are in use with high pressure steam. A somewhat larger ratio of cylinders is also to be used, and a larger area of L. P. for the horsepower is thus caused by providing an engine designed to expand the steam about 11 times at full power instead of 7 or 8 times as had been the usual practice in man-of-war. An engine 28¼-in. H. P. x 45-in. I. P. x two 62-in. L. P. and 36-in. stroke, 200 revolutions is contemplated. A still larger proportioned L. P. cylinder is desirable for purposes of economy, but the general disinclination to depart from former practice to any great extent has operated to take a half way stand in this respect.

It is only by providing a large L. P. cylinder—one that is capable of allowing steam used to expand a great many times—that good economical results can be obtained. In the design of engines special care will have to be taken that working parts are stiff and strong; that bearing surfaces are ample and that a stiff framing is obtained.

The valve gear will be of the Stevenson type, the H. P. valve 16½-in., two I. P. 18½-in. and two L. P. 25-in. all of piston type.

Special provision as to lagging of cylinders is to be made so that losses from radiation and liquefaction may be reduced as far as possible.

BOILERS.

The boilers must be of a design where lightness as well as reliability are obtained, the furnaces arranged so that coal can be readily brought to the fires, the fires easily worked and cleaned and the ashes disposed of.

The main supply bunkers should be directly abreast the fire rooms so that the arduous labor of taking coal from bunkers may be reduced to a minimum. The total coal capacity will be something over a thousand tons.

A consideration of the various types of boilers will result in the choosing of boilers of a modified Normand type, having the tubes arranged to form baffles so that the products of combuston have a double pass among the tubes. With these boilers the uptakes are at the back and baffling is arranged so that the flames enter at the back, come forward, turn and then go back to the uptake. The tubes themselves form the baffling. Thus all special

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material for baffling is eliminated and a very good economical performance is promised.

The most feasible arrangement in the space allowed will be twelve boilers in three water-tight compartments. The grate surface as designed will be about 680 sq. ft. calling for about 25 I. H. P. per square foot of grate. The heating surface to be of a ratio $\frac{H S}{G S}$, about 50. At full speed the boilers will consume about 300 tons of coal per day.

BOILER ROOM AUXILIARIES.

The boiler room auxiliaries will consist of blowers to be operated either by steam turbines or reciprocating engines. As the full power of these vessels will depend upon the proper functioning of the blowers, special precautions are taken to secure their reliability. They are to be placed in ample space on the deck immediately above the boilers where every facility for overhaul and operation may be possible.

Each boiler room will have a bilge pump for operating ash ejectors and for drainage and fire purposes. In these vessels which are intended to run under forced draft for long periods ash ejectors are a necessity. Each boiler room will also have a feed pump which will have no sea connection whatever to be used as an emergency feed pump, and for filling and emptying boilers. By leaving off all salt water connections from the feed pumps the danger of getting salt water into boilers is reduced. The boilers are especially designed to be accessible in every way for cleaning, operation and overhaul.

The weight of boilers for 16,000 I. H. P. is estimated at 200 tons wet (this does not include uptakes). Notwithstanding this light weight it is thought that these boilers will be as economical as any other type owing to the use of short grate, large ratio of heating surface and superior baffling arrangements. Owing to the fact that all parts are accessible and arranged so as to be in a position least favorable to deterioration, fairly long life for these boilers is assured.

AUXILIARIES IN ENGINE ROOM.

In selecting and providing for the auxiliaries for the scout vessels, special consideration must be given that these in their characteristics do not nullify or detract from the efficiency of the main engines and the boilers, and that they are of such a type as not to interfere with necessary characteristics of the vessel as a whole.

This is a somewhat complex problem and must be looked at from all sides from the standpoint of convenience of construction and installation, as well as from the requirements of convenience in operation and care.

The auxiliaries may be classified into two divisions. (A) Those essential to the operation of the engines. (B) Those not essential to operation of engines.

The design of the first class should have the paramount consideration. They are condenser, air and circulating pumps and feed pump.

The condenser, air and circulating pumps are required for condensing the steam and securing the vacuum. In past torpedo boat practice too little attention has been given to securing thoroughly efficient apparatus of this kind.

The trials of most torpedo boats and torpedo boat destroyers give us a record of vacuum varying between 20 in. and 22 in. By careful design it is possible to obtain a vacuum of 28 in., the difference in the economical performance is one of great magnitude. If turbines are contemplated the importance of having a good vacuum is even greater than with reciprocating engines.

For these reasons attached air pumps and Scoop condensers are not contemplated. The saving of weight obtained resorting to these devices does not compensate for the decrease in efficiency and economy.

The question of wet vacuum and dry vacuum also appears. Wet vacuum apparatus is the only one ordinarily installed in marine work. The air pump being a reciprocating pump pumping the condensed water and vapor from the bottom of condenser.

In the dry vacuum apparatus the water and vapor are separated—the water is drawn off with an ordinary hot well pump and the vapor and air by the dry vacuum pump which is a high speed fly wheel pump. The dry vacuum apparatus requires more space and adds one more auxiliary, but if such a system can produce a vacuum of 27½ in. with 1 sq. foot of cooling surface per 16 lbs. of water condensed per hour, and the circulating water at 70° Fahr., its value is probably enough to authorize its installation.

In the turbine arrangement there is perhaps a greater possibility of giving the needed room, and in such ships the dry vacuum condensing apparatus may be installed with advantage.

The type of circulating pump will be of involute centrifugal type. Its drive brings up the question of turbine versus reciprocating compound engines. Either is quite satisfactory when a good design is used, and the difference in efficiency or weight one way or the other is hardly a question of importance. The high speed centrifugal pump should be favorably considered owing to reduction in size and weight over those of large diameter and low number of revolutions.

Reliability is with the feed pump the prime consideration; weight and space must be sacrificed to secure it. The margin of capacity, if a thoroughly reliable pump, can be somewhat cut down from general naval practice. On the present design it is considered that 1.8 full boiler capacity at 100 ft. piston speed will provide a sufficient margin for the main feed pumps.

AUXILIARIES NOT ESSENTIAL TO WORKING OF ENGINE.

Feed heaters, though not absolutely essential, must be fitted to secure the great gain in economy as well as to lessen wear and tear on boilers. Heaters on discharge side of main feed pump owing to their good efficiency will be used.

An evaporating plant sufficient to maintain the supply of extra feed at full power will be provided and reserve tanks for carrying an additional supply will also be fitted.

Fire and bilge pumps are to be located as usual one in each engine and boiler compartment. The pumps in boiler compartments to be fitted for operating the ash ejectors and for extinguishing fires on grates.

An ice machine and small refrigerating room are to be supplied. This should be considered as a necessity and not as a luxury.

A dynamo plant for lighting and operating electrical auxiliaries, such as ventilating blowers and work shop motors will be installed.

Boat hoisting winches to be operated by electricity.

Steam steering and steam windlass engines will be fitted as usual practice in marine work.

Owing to the fact that each boiler and each engine room is isolated, and as no transverse bulkheads are cut, special provision must be made for signaling orders from one point to another.

ECONOMY.

Considerations for economy for coal consumption in the design of a scout ship are of paramount importance, and in the lack of appreciation of this fact in U. S. torpedo design lies one great reason for the inability of many of our torpedo boats to obtain their original designed speed even for a short spurt over the measured mile. Probably the most successful torpedo boat builder in the world is Normand, and in his designs economy is thoroughly considered.

The limit of the scout's usefulness is her endurance. This is directly dependent upon her economical performance,

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not only as regards to the endurance of the fuel supply, but the endurance of the personnel. The question of personnel must be considered, and if by a reduction in coal used per I. H. P. the arduous work of the fireman and coal passer is reduced, a most material tactical advantage is obtained.

In order to thoroughly test a scout for determining her qualities of usefulness, she should be subjected to a coal consumption and endurance trial of at least 24 hours' duration. The present trial requirements for U. S. vessels give a result that is almost meaningless as far as service efficiency is concerned.

SEES HOPE FOR AMERICAN SHIPPING.

John A. Donald, president of the Donald Steamship Co., has just returned to New York from Britain, where he has placed orders for two new vessels to be constructed by Messrs. Swan & Hunter, and Wigham Richardson, Ltd., and which will be completed next May. The new vessels will be put into service in the fruit trade betwen the West Indies, Central America, and the United States, under a four-year lease, to fruit-carrying concerns, on such terms as to yield a handsome profit to the steamship company. President Donald is a firm believer in great possibilities in the development of the American merchant marine, but he says that under the present circumstances growth is seriously hampered by the restrictions placed upon American ship owners and the competition which American ship builders meet from foreign sources. "My hopes," said Mr. Donald, "are that the American shipping industry will develop in the same manner as have American railroads, and that the securities of American shipping concerns be regarded in the same class as American railroad shares as investments. There is a great future for American capital in the shipping industry. Hundreds of ships of foreign make and foreign ownership are now in operation carrying millions of dollars worth of trade to and from American ports. Proficiency in ship building now exists with the English, but American cleverness and enterprise, could, he believed, easily gain its share in this industry if proper legislation were enacted. The British ship builders had the advantage now, in being able to turn out their product at two-thirds or less of the price which American ship builders would be compelled to ask. By reason of the long experience of Englishmen in this branch of industry, the work has been so systematized and specialized, as to bring the cost down to a minimum. There were dozens of firms, each making a specialty of some one part used in the construction of a steamer, and the contracting firm had the benefit of keen competition from several sources in the purchase of the constituent parts necessary to the completion of a vessel, whereas in America, ship building facilities were so limited that competition of this nature was practically eliminated. The British builders were so rushed with work that it was with difficulty one could get an order placed for delivery at a specific time in the near future. The solution of the ship building and merchant marine problem in the United States would be found, he believed, either in the grant of a ship subsidy or free ships, preferably the latter. Under present conditions, an American cannot take title in his own name or in that of an American corporation to a foreign-built ship. The result is that virtually, all of the American trade is carried in foreign bottoms. Mr. Donald is firmly convinced that during the present session of congress a long step will be taken toward overcoming the handicaps which heretofore have rested on the American shipping industry, and expects to see this field of development greatly broadened, and assume a prominent position among the American industries. The construction of the two steamers is well advanced, and they have been chartered to the United Fruit company for a monthly rental of $4,000, payable in advance for a period of four years from May, 1906, at which time they will be completed. The present fleet of the company is composed of five steamers, built entirely of steel and iron, and especially fitted for the fruit-carrying trade. The company claims to be the first American organization to engage in the chartering of vessels in the banana trade, as the business heretofore has been in the hands of European owners.

Sir William White, K. C. B., in an address on "Submarine Navigation," at Glasgow last month, said that supremacy on the seas would never be attained by means of submarines. It was the weapon of the weaker power, and was also a less costly means of offence than the sea-going ship. It was, however, very limited in its range of action, and, while those who used submarines had certain advantages, tremendous risks were involved. Submarine navigation involved existence on a knife edge, but he did not say the risks should not be taken. He himself had very nearly come to grief on a submarine, but he would not in the least mind going in a submarine with a properly trained crew. It was a hard life for the men on board these ships, but they had their homes on the mother ships. They were all volunteers, picked men, and highly paid in all ranks, indeed there was never any doubt about getting volunteers for the submarine service.

CHIEF ENGINEER'S LICENSE RESTORED.

Capt. John Birmingham, United States supervising inspector of steam vessels at San Francisco, has just reversed the decision recently rendered by Local United States Inspectors Bolles and Bulger, in the case of Hugh W. Salbador, chief engineer of the steamship Californian. Salbador's license was suspended for three months, as he was held responsible for the death of one man, and the severe scalding of several others, by reason of not having reported the leaky condition of boiler tubes to the proper authorities, as he should have done, before the steamship left New York for San Francisco.

Salbador appealed from the decision on the ground that he was not responsible for the accident. He succeeded in making such a good showing before Birmingham, who reviewed the case, that the latter official reversed the decision and restored Salbador's license. This case has attracted much attention among San Francisco marine engineers.

WILL ADD A NEW VESSEL.

The firm of Wilson Bros. & Co., of San Francisco, Cal., who own the steamer G. C. Lindauer and a number of other vessels, will soon add another steam schooner to their fleet. The new vessel will be 184 ft. long, 38 ft. beam and 13 ft. hold. She will be an oil burner, and her engines, which will be triple-expansion, will be constructed at the Risdon Iron Works. She will be equipped with double winches. The new vessel will ply between San Francisco and Gray Harbor, Wash.

Mr. Lyman C. Smith, vice president of the Toledo Ship Building Co., in an interview in Toledo stated that the Lyman C. Smith Transit Co. will give the Toledo Ship Building Co. an order for a new 10,000-ton freighter during the present year, a duplicate of the steamer now building at the Wyandotte yard for the company. He added that work would be pushed upon the freighter as soon as the weather permitted.

Mr. Henry Van Alstyne, state engineer and surveyor, of New York, was severely cut and bruised in a head-on collision on the Albany & Hudson Electric railroad, near Nashua last week.

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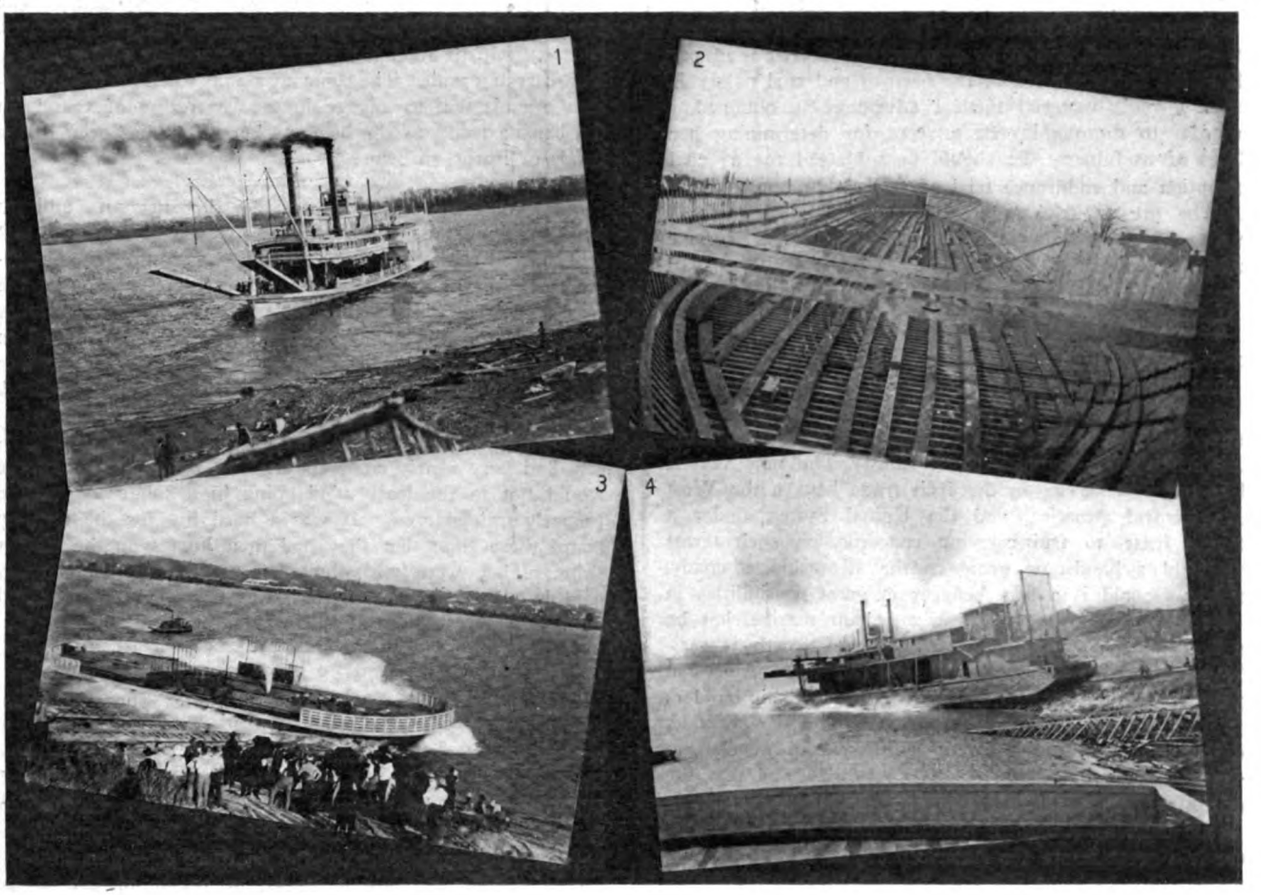

SOME PRODUCTS OF HOWARD'S SHIP YARD, JEFFERSONVILLE, IND.

1. A River Steamer. 2. A River Vessel in Frame. 3. Launch of a River Hull. 4. Launch of a River Dredge.

VIEW OF THE LAKE UNDERWRITER.

Buffalo, Jan. 2.—The lake underwriter is, of course, the worst disappointed member of the lake interests. He sees a heavy loss during the past season to be reported to his companies and is only grimly content with the reflection that not much has been realized out of the business for a long time. One of them said the other day that for many years the net earnings had not been more than 1½ per cent in any case, and that with a realization of the most sanguine hopes the losses of the season just past could not be made up in three seasons.

Possibly this view of the case may be modified a trifle when the losses are all in, but it takes so long to assemble them that it will be months before even a good estimate can be made except in the rough. So many owners neglect what would commonly be considered a vital point that the insurance interests are never quite sure but that some big loss will come in at any time and upset any total that they may have made out.

This state of things naturally brings out the question as to the utility of lake insurance. It is well known that as fast as the fleet becomes bunched, a dozen vessels or so under a single ownership, there is a disposition to give up insuring at all, as it is found that the premiums in such a case will soon pay for a new vessel if one is lost. The theory of course is that there is in that case no insurance machinery to pay for and that insurance anyhow is a mere safeguard against being bankrupted by a big loss where the holding is small. If I have only one or two vessels I cannot risk the loss of one or them, so I insure, but if I have twenty it is different, and it is still different if I have a hundred or so.

They say it would take a million and a quarter to insure the steel corporation fleet, so it appears that it has not been hit so very hard by the late fall storms as one might suppose. Suppose it loses a big steamer or two, it can afford to. Of course there are many partial losses to one total one, but where the fleet is so closely backed by the wrecking system set up by the tug association the case is very different from anything known a dozen or more years ago, when the wrecking master attached to the big insurance office was pretty nearly indispensable to the work of floating a bad wreck or deciding if it was worth the while to spend a lot of money in the undertaking.

I find that the vessel owners are putting considerable stress on the escape from the many survey and docking expenses they avoid by not insuring. So long as a craft is kept seaworthy during the active season it is best to keep her at work. Then after the fleet is laid up in the fall all injuries can be straightened out with a single docking and there is less expense as well as less valuable time lost. Then there is the escape, usually, from the many disputes of a legal nature that used to keep a vessel tied up much of the season sometimes, neither party to the litigation being willing to release the boat pending the settlement.

It is understood that the lake underwriters look on the situation as demanding higher hull rates and yet it is going to be a hard task to make the advance. There are not the classes to scatter it through that there used to be. Take a vessel register and it is astonishing how many

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vessels there are classing A1 as compared with the days when there was only an occasional metal hull in the list. What puzzles the layman is the fact that with the condition of the fleet improving so fast of late it is still as hard to keep rates up to a paying basis as it ever was. The old wooden fleet had to be put up so high that insuring them was often out of the question, and yet the premiums were not enough to meet the losses and pay a fair income.

Would it not be a queer undertaking to work one of the large steamers through the inter-lake passages with the aids to navigation what they were twenty-five years ago! No depth, no locks, no lights as compared with the present accommodations. And yet in half a dozen years there will again be the same occasion for wonder, especially if the wireless telegraph system is in full operation by that time. Still, even that has not gone far enough to show a captain when he is out of his course, and it is the stranding in narrow passages that still seems to be the difficulty that even the lights and deepening of channel have not been able to touch as it would seem that they should.

With change of condition and increase of aggregate business about as great as ever, enabling the individual vessel owner to hold his own much better than was once thought possible, it almost seems as though there was no end to this rapid development.

JOHN CHAMBERLIN.

CABLES FOR THE CUNARD FLYERS.

Engineering, London, gives some interesting particulars of the cables now being made for the new quadruple screw turbine vessel now being built for the Cunard Company by Messrs. Swan, Hunter & Wigham Richardson, Ltd., of Wallsend-on-Tyne. The makers are Messrs. Brown, Lenox & Co., of Pontypridd, South Wales, who have been engaged in the manufacture of cables for the Admiralty for nearly a century. This company made the cables for the famous Great Eastern, the links of which were of the then unheard of diameter of 2⅞ in. They have not only forged the links of the chain, but have manufactured the iron bars and the crucible steel studs. The iron is 3¾ in. in diameter at the smallest part of the link; each link is about 22¼ in. in length, and with the cast steel stud weighs about 160 lb. The Cunard Company recently required three links to be tested to destruction, so three links were cut from the cable and sent to Lloyds proving house at Netherton in Staffordshire. The testing machine there is one of the most powerful in the country and is licensed by the Board of Trade to test chains and anchors of the largest sizes. Under the Admiralty proof strain of 198.8 tons, each link elongated nearly ¼ in. The statutory breaking stress of 265.7 tons was next applied, the result being a further elongation of the links of about ¾ in. Then an attempt was made to test the sample to destruction, but the full power of the machine of 350 tons failed to break it, indeed it is understood that the actual tension applied was over 370 tons. An examination of the links after this test showed no sign of fracture nor defect of any kind, although the stress applied was about 90 per cent above the Admiralty proof stress. The building of the large Cunarders has called for record-breaking achievements in almost every branch of engineering, and the way in which manufacturers have risen to the special requirements of the occasion is a credit to themselves and a good augury for the success of the vessels.

SYNDICATE TO CONSTRUCT TURBINE LINERS.

The announcement of a syndicate for the construction of several large turbine liners for service in the colonial trade has excited considerable interest in British shipping circles, and further inquiries go to show that several well known British financiers and ship owners are associated with the enterprise. It transpires, however, that nothing definite has yet been arranged as to the ports between which and the colonies, the proposed new liners will run, and that the service is not particularly intended for the development of any specific trade as between the Bristol channel and British possessions across the seas. The chances of Cardiff and other Bristol channel ports will depend upon the facilities which they will be able to offer the promoters, and in this connection it is urged that a good deal might be done by the local dock and railway authorities. It is said that specifications already have been prepared for half a dozen magnificent turbine driven vessels of 15,000 tons each.

LAUNDERED AIR.

In the office building of the H. K. Porter Co., at Pittsburg, Pa., an apparatus has been installed in connection with the heating and ventilating system whereby the air is washed and all dust and soot removed before it is put in circulation. This device, installed by the B. F. Sturtevant Co., of Boston, Mass., consists of a metal supporting frame filled with coke over which water trickles. All air entering the building is drawn through this filter by means of a fan and delivered under pressure to the various rooms. It is stated that during the past summer the fan has been operated continuously with the windows closed, the air has been thoroughly cleansed, its temperature lowered, the health of the office force improved and their daily output increased.

The successful operation of this system has stirred the muse of the *Louisville Courier-Journal* to perpetrate the following:

LAUNDERED AIR.

"I can stand for tainted money, I can stand for tainted grub;
I can drink polluted water and employ it when I scrub,
But since noting this invention I shall never, I declare,
Be content again with breathing anything but laundered air.

Give me clothing filled with shoddy, filled with microbes, if you will;
Let a million microbes bite me when I touch a dollar bill;
Let the germs come swarming o'er me when I take an easy chair,
But I pray you do not give me anything but laundered air.

If ozone may be laundered, can't we neatly crease it too—
Hand it round in snowy bundles like the laundry people do?
Oh, I hope the time is coming when to laundries we'll repair
Bright and early Monday mornings for our week's supply of air."

SYSTEM.

I find in the *Iron Mongers' Chronicle* this bit of verse, which I think is rather good, and hits well at anyone who might have a good system badly carried out.

Oh, isn't it great to be up-to-date,
And live in this year of grace;
With a system and place for everything,
And nobody knowing its place?
Why we have a card for each thing we do
And for everything under the sun,
But it takes so long to make out the cards
That we never get anything done.

Basinstoke, Eng. DAVID GARVIE.

Mr. C. A. Edson, of the Edson Boat Co., Skaneateles, N. Y., with works at Mottsville, reports a number of orders for launches of 50 ft. together with canoes and rowboats for 1906. Mr. Edson was formerly with the Wyandotte Pleasure Dock Works, of Wyandotte, Mich.

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WHY AMERICAN SHIPPING HAS DECLINED.

The *Atlanta Journal* is pleased to refer to the shipping bill as "that perennial old graft." The *Journal* argues that the United States cannot build a merchant marine because the foreigner can build cheaper ships. It asks "Why can he build cheaper ships?" and answers it by saying "Because he can get cheaper material." It then says that the British ship builder get his material largely from America. That, however, is not true. He gets a part of his material from America, it is true, but the American ship builder has the privilege of importing from abroad, free of duty, material to be used in the construction of ships to be used in the foreign trade. This law has been on the books for over a dozen years, but it has been proved to be of slight benefit, as the real difference in the cost of British and American ship construction lies in labor. The protective tariff policy has everything to do with this difference, but not in the way that the *Journal* argues. Under the protective tariff policy this country has grown great industrially. The only industry that has been exempted from the benificence is that of shipping, and the consequences of that exemption are very well known. It is unfair to the capital invested in American shipping to exempt it from the operations of a policy which, by the very virtue of the policy, is imposing an unjust handicap upon shipping. The country should have free trade throughout or it should have protection throughout, and the policy, whatever it is, should apply to all.

SETS A FINE EXAMPLE.

The Pittsburg Steamship Co. has set a fine example to vessel owners generally, offering free courses of instruction in the use of the compass, its error and correction, to the masters of its vessels. Schools will be opened at Cleveland, Conneaut and Marine City, under the direction of Capt. J. M. Fields, and instruction will be free to all masters of this fleet. The importance of this work, especially on the great lakes where the compass is subject to such violent fluctuations, is well understood. The department of marine of the Dominion government has just comissioned Capt. Thomas Donnelly, of Kingston, Ont., to give a course of similar free lectures to Canadian mariners. The first of these lectures was delivered in the Old Collegiate building at Kingston last week by Capt. Donnelly. Capt. Donnelly emphasized the fact that navigating the great lakes is a peculiar business and that the demand for really competent men is greater than the supply. He even intimated that in proportion to the enormous volume of commerce and its value there was a scarcity of good men. He thought that a high degree of skill has been attained by lake mariners as is proved by the small number of accidents to the great number of ships. The exigencies of the service teach the masters of vessels the necessity for quick and decided action in time of danger. Capt. Donnelly hoped that the department of marine would not hamper lake mariners with conditions which are very necessary on salt water but which have no place on the great lakes. What the great lakes master requires is the knowledge to enable him to keep good track of his ship on the chart, a good understanding of the compass with its errors and corrections and a thorough knowledge of the rules of the road. Training on these points with an intimate acquaintanceship of the channels to be navigated are the essentials of lake navigation.

It is not many years since the first steam freighter was built on the lakes. Prior to that and for a considerable time thereafter the commerce of the lakes was carried in sailing vessels. These vessels afforded the best possible training for the master or mate, but when the sailing vessels came to the rivers they were usually taken charge of by tugs. The master of the modern steamer, however, must take his vessel

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through the rivers in all conditions of weather, either day or night, and must have a thorough knowledge of where the last inch of water is to be got. Last year the vessels of the great lakes carried 44,000,000 tons of freight through the Sault Ste. Marie canals alone and in certain parts of the rivers the great freighters, carrying this tremendous trade, had only an inch or two of water under their bottoms Capt. Donnelly attributed the cause of a number of wrecks to a lack of knowledge of the compass and thought the Pittsburg Steamship Co. had done a very wise act in offering free courses of instruction in compass correction to its masters. Undoubtedly those who attend Capt. Donnelly's lectures will be well repaid for their time.

NEW STEAMER FOR BELLE ISLE RUN.

The Detroit, Belle Isle & Windsor Ferry Co., have just closed a contract with the Detroit Ship Building Co., for a fine new steamer for service on the Belle Isle run. This new boat will be practically a duplicate in design of the big steamer Columbia of the Bois Blanc route but will be not quite as large in dimensions, however. It will be built as large as can be conveniently handled at the Belle Isle dock. Her steel hull will be divided into six watertight compartments. The main deck and deck houses will be constructed of steel, which insures protection from fire. The officers of the company have realized that Detroit is a growing city, that its people enjoy the river and that nothing increases business so much as good equipment. While this boat is to be rather large for the present needs of the route, the company wishes to anticipate conditions, take good care of its patrons and be protected for future demands for larger carrying capacity. The new boat will be one of the most powerful ice crushers on the Detroit river and on this account will have extra strong hull, heavily reinforced. This provision in construction is made in order to insure the Windsor patronage of good service no matter how much ice may block the channel. Frank E. Kirby is the designer. The general dimensions are as follows: Length over all, 180 ft.; length between perpendiculars, 165 ft.; breadth of hull, 45 ft.; breadth at water line, 42 ft.; breadth over guards, 57 ft.; depth of hull, 18 ft.; draught, 12 ft. Engines are triple expansion, cylinders 20, 32 and 50 in. diameter by 36-in. stroke, supplied with steam from two Scotch boilers, each 13 ft. 3 in. diameter and 12 ft. long, carrying 180 lb. of steam. The steamer is designed to make 16 miles an hour and will have passenger capacity for about 2,700 persons. The steamer is to go into commission July 1 next.

AROUND THE GREAT LAKES.

Mr. J. C. Evans, western manager of the Anchor Line, has announced the appointment of B. C. Jones as superintendent of hulls.

The tug T. C. Lutz has been chartered by the Pere Marquette Co., to break ice for the car ferry steamers in the Detroit river during the winter.

Capt. Wm. A. Searles who sailed on the lakes for many years died at Unionville, O., this week. He was stricken with paralysis aboard the steamer Iosco about a year ago and never recovered.

Mr. Fred D. Philp, chief engineer of the steamer Peter White during the past season, has left for Leadville, Colorado, to become the mechanical superintendent of a mining company.

The annual meetings of the Lumber Carriers' association and the Lake Carriers' association were held at Detroit this week. Complete reports of these meetings will be found in the next issue of the MARINE REVIEW.

The new freighter building at the Cleveland yard of the American Ship Building Co., for Capt. W. C. Richardson, of Cleveland, will be named in honor of Mr. David C. Norton, of Cleveland.

In an interview in Milwaukee, Capt. John V. Tuttle, who takes charge of the wrecked and rescued vessels for the underwriters, says that last season was the worst in his experience which covers fifty years.

The American Ship Building Co. is working with characteristic energy to rebuild its Bay City plant, lately destroyed by fire. It is expected that the plant will be entirely rebuilt within the next two weeks and on a much more extensive plan than the old one.

The steamer Darius Cole will probably be remodeled and put on the Georgian Bay route next summer running from Detroit and Toledo to Georgian Bay resorts. Plans to give her about seventy additional staterooms are now being made by the joiner department of the Detroit Ship Building Co.

Vessel owners believe that the new storm warning station for Devil's Island, Lake Superior, is practically assured by the recent recommendation by the secretary of agriculture that $22,000 be appropriated for the station. The Lake Carriers' Association will, however, remind congress of the necessity for this warning station. The proposed station will be nineteen miles from Bayfield, Wis., and will be connected with the mainland by telephones.

The West Superior yard of the American Ship Building Co. is crowded with work, and Mr. Robert Logan, general manager of the company has gone there to look after it. There are at present 1,200 men on the yard's pay roll. One of the two boats to be built for the Cambria Steel Co. will be constructed at this yard. Mr. Logan says that the boats are to be the largest on the lakes, being 2 ft. longer than the 600-footers building for the Pittsburg Steamship Co.

Mr. A. L. Eggert and Mr. M. Toner of the Pittsburg Steamship Co.'s fleet will remain ashore during the coming season, to look after the launching of the four 600-footers building for the company, and the installation of their engines. The hulls of these vessels will be built at Chicago, but the engines will be constructed at Cleveland.

The annual meeting of the Cleveland lodge of the Marine Engineers' Beneficial association was held last week. The following officers were elected: President, Arthur Hyde; first vice president, Ben Hinslea; second vice president, P. A. Rivers; recording secretary, Ray Belting; financial and corresponding secretary and business agent, Wm. Kelley; treasurer, John M. Kirby; trustees, E. I. Jenkins, John N. Kirby, A. R. Newman; district deputy, John Skelly. E. I. Jenkins, John M. Kirby and Arthur Hyde were elected delegates to the national convention which will be held in Washington next week.

Thirty-four mates out of the forty-two that were on first class steamers of the Pittsburg Steamship Co.'s fleet last season have been paid a bonus. President Harry Coulby announced last spring before the men went to their boats that all the first mates of the forty-two first class steamers that remained in the employ of the company during the season would be paid for ten months' work, providing their services were satisfactory. The mates usually work about eight months during the season. The mates on first class steamers of this fleet are paid $115 a month, so that these thirty-four men received $1,150 for last season's work.

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SENATOR GALLINGER ON THE SHIPPING BILL.

Washington, Jan. 8.—Senator J. H. Gallinger, of New Hampshire, Chairman of the Merchant Marine Commission, addressed the Senate today, opening the debate upon the shipping bill, framed by the Commission and favorably reported to the Senate from the Committee on Commerce.

Senator Gallinger quoted from President McKinley's last speech at Buffalo, in which he deplored our inadequate steamship service, especially to South America, and urged that—

> Next in advantage to having the thing to sell is to have the convenience to carry it to the buyer. We must encourage our merchant marine. We must have more ships. They must be under the American flag, built and manned and owned by Americans. These will not only be profitable in a commercial sense, they will be messengers of peace and amity wherever they go.

Since that time, said Senator Gallinger, President Roosevelt has thrice called the attention of Congress to this matter, recommending in his annual message of December 7, 1903, the appointment of a joint commission, which Congress authorized. This is the commission whose bill for the upbuilding of the merchant marine is now under consideration.

President Roosevelt said:

> To the spread of our trade in peace and the defense of our flag in war a great and prosperous merchant marine is indispensable. We should have ships of our own and seamen of our own to convey our goods to neutral markets, and in case of need to reinforce our battle line. It cannot but be a source of uneasiness and regret to us that the lines of communication with our sister republics of South America should be chiefly under foreign control. It is not a good thing that American merchants and manufacturers should have to send their goods and letters to South America via Europe if they wish security and dispatch. Even on the Pacific where our ships have held their own better than on the Atlantic, our merchant flag is now threatened through the liberal aid bestowed by other governments on their own steam lines. I ask your earnest consideration of the report with which the Marine Commission has followed its long and careful inquiry.

WILL CONGRESS HEED?

"The practical question now before us," Senator Gallinger went on to say, "is, will Congress heed the admonitions of Presidents McKinley and Roosevelt or will it continue to neglect this important industry until the remnant of our once prosperous merchant marine is driven from the seas? Today alone of all the nations ambitious for mercantile expansion, the United States neglects its ocean shipping. Our coast and lake fleets, protected by federal statutes, are the most prosperous and the greatest in the world. Taking the coast, lake and river ships together we have a merchant navy of 5,500,000 tons, or six times the size of the poor shrunken fleet of 888,000 tons registered for foreign commerce. The gradual disappearance of our ship yards, the bankruptcy of our ship merchants, the loss of our skilled mechanics and seamen, though a calamity and a great one, is far less serious than the cramping and withering effect of our lack of American ships on the export trade of the United States. William McKinley's prophetic vision in that final address of his to his countrymen saw that without ships of our own to convey our goods to our customers we should be more and more hopelessly handicapped against our maritime competitors in the neutral markets of the world.

NO MERCHANT SO NEGLECTFUL.

"To take a familiar but just illustration, what department store in any American city, engaged in a sharp contest for business, would dream of intrusting to a rival store the delivery of its goods to its customers? Is it not a fundamental principle of such keen competitive business—with which the rivalry of America and Europe in international commerce may not inaptly be compared—is it not the prime instinct of every successful merchant in such business to maintain an active and comprehensive delivery service of his own? Would any merchant conducting such a store sell or lay up his own wagons and neglect to provide others, even if his competitor offered to do the work more cheaply? It would be a poor judge of human nature, indeed, who would consent to such a proposition. His fellow merchants, partners, or assignees in the bankruptcy proceedings that would certainly ensue would have grave question of his sanity.

"Our formidable competitors are Great Britain and the two continental nations that front on the North Sea and the Bay of Biscay. What Great Britain, France and Germany have done and are doing is of very live significance to the United States."

BRITISH STEAMSHIP SUBSIDIES.

Senator Gallinger went on to speak of the generous British policy of steamship subsidies, beginning in 1840 with the Cunard Line. "At that time and for years before the entire trans-Atlantic packet service in sail ships was conducted by Americans, but the British subsidized steam lines, beginning to drive our packets off the ocean, the United States, under the initiative of President Polk, and by vote of a Democratic Congress, met this attack by the offering of generous mail subsidies to American trans-Atlantic lines, of which the Collins line became most famous and successful. The new American steamers were larger and faster than the Cunard ships, but Mr. Cobden, Mr. Gladstone and the other British statesmen, who were now proclaiming on land the transcendent virtues of free trade, nevertheless continued to vote lavish subsidies to the inferior Cunard ships that but for the subsidies would have been straightway driven from the passage. What the end of the rivalry would have been if the United States held on can only be conjectured, but the unhappy feud between the north and south in Congress led to the canceling of the mail subsidies in 1858 at the very crisis of the contest, and for thirty years after 1861 the British flag retained mastery of the North Atlantic.

"In the South Pacific also the British government subsidized the Pacific Steam Navigation Company, which was started by an American, Mr. William Wheelwright, who had unsuccessfully sought to interest his own government in the enterprise. Besides, parliament by a generous subsidy of $1,200,000 created a British steam line to the West Indies, the Isthmus of Panama, Brazil and Argentina. So effective has been this British maritime protectionism that in the ports of Chile, Bolivia, Peru and Brazil the Stars and Stripes flying from an American merchant steamer are now never seen, while British commerce, which these subsidies were given to promote, far surpasses ours in every one of these Latin American Republics.

GERMANY'S EXAMPLE.

"Until a quarter of a century ago German sea power was insignificant. A 'free ship' policy was in force under which there had come no real growth in the German fleet. German tonnage increasing only from 1,098,000 in 1873 to 1,277,000 in 1881. In Germany, as in France, 'free ships' tested alone without national aid and encouragement had utterly failed to bring any substantial increase in the commerce-creating power of the national marine. In 1881, France dismayed at the results of a 'free ship' policy, turned to subsidies and bounties to save her ship building and navigation. Bismarck urged upon the German parliament to follow the French example, pointing also to the splendid results the British had secured by the long-continued and generous policy of subsidizing ocean mail lines to the chief markets of the world.

"Germany had under the protective system so developed its manufacturing resources that, like the United States, it found the need of a foreign outlet more and more imperative. Bismarck's plea for German ships to deliver German goods to foreign customers won from the Reichstag a mail subvention of 4,400,000 marks

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($1,047,000) a year for fifteen years for a German steamship service to China, Japan and Australia. The speed was only 11½ to 13 knots an hour, and the German government required that the new subsidized steamships should be built in German yards by German workmen. In 1888, two years after the East India service started, the exports of merchandise by these German ships were in quantity 27,369,000 tons and in value 33,190,000 marks. By 1896 these exports had increased to 89,148,000 tons, valued at 74,433,000 marks. The mail subvention of 4,400,000 marks a year had brought an increased export trade of more than 50,000,000 marks to the German empire, and this was only the beginning of German expansion in the markets of the Orient.

GREAT GAIN OF GERMAN COMMERCE.

"In 1890, the Reichstag granted another subvention of 900,000 marks ($214,000) to create a German steam line to East Africa. The earnings of this line advanced from 450,000 marks, or only a little more than twice the subvention in 1892, to 1,476,000 marks in 1898. This swift expansion of German trade under the impulse of generous mail subventions to German steamships forms a significant contrast with our own stand-still commerce in those South American countries, where all the ocean going ships fly European flags, and are controlled by European interests.

"In 1898-99, the Reichstag directed a renewal of both the Asiatic and African mail subventions for another fifteen year period, increasing the compensation and requiring improved and extended service. But no greyhound speed was exacted of these German steamers; the moderate rate of about 13 knots on the Asiatic and 10½ to 12 knots on the African line was regarded as sufficient for German commercial purposes.

"These imperial mail subventions are by no means the only method by which the government encourages shipping in order to expand German commerce. Shipyard materials are hauled at a nominal figure on the German State railroads, which also transport at a very low rate merchandise intended for export by German steamers. British merchants complain that this German railway policy is throwing more and more of the far eastern carrying trade into German ships. All the mightly influence of the imperial government is constantly exerted to honor those who are connected with the building up of German shipping. Not until Germany began to build and own her own ships and carry her own trade did she begin to be considered as a serious factor in the commerce of the world. This wonderful maritime expansion has made her mercantile expansion possible. German merchant tonnage, that under a 'free ship' policy, without State aid, increased only from 1,098,000 in 1873 to 1,243,000 in 1881, has, with State aid, grown to 3,393,000 in 1904, and German commerce has expanded in almost like proportion.

THE FRENCH EXPERIENCE.

"France, like Germany, long and patiently tried the 'free ship' policy, beginning in 1866. In 1872-73, dismayed at the results, France resorted for a short time to discriminating duties, but was forced to give them up by the threatened retaliation of other nations. 'Free ships' were then renewed. In 1870, France had a merchant tonnage of 1,072,000; in 1881, after a long experiment with 'free ships' French tonnage had fallen to 914,000, while French ship building, overwhelmed by British competition, was so nearly dead that it was difficult to keep up the construction of the navy.

"After this experience, the French government, in 1881, offered a system of bounties for ship building and subsidies for navigation, applying to the entire ocean going fleet of France. It was successful from the first in encouraging French navigation—the proportion of long voyage traffic increased from 28 per cent in 1880 to 39 per cent in 1890. At first the effect on French ship building was disappointing, and there was an abnormal increase of French sail tonnage at the expense of steam. However in a subsequent revision of the French subsidy law, these defects were amended, until in recent years, there has been a large growth in the entire French marine. French steam tonnage, which was 805,000 in 1890 had grown to 1,266,000 in 1904; while French sail tonnage had increased from 298,000 to 494,000.

AMERICA LAGGING BEHIND.

"Germany now pays an annual subvention of $1,330,000 to the North German Lloyd for a steamship service to China, Japan and Australia. Great Britain pays $1,600,000 to the Peninsular and Oriental for a steamship service to the Orient. France gives to each of her two great companies a mail subvention of from $1,500,000 to $2,000,000 a year. The United States in the fiscal year 1904 paid to all the lines under the American flag in mail subventions, including $690,000 to the American Line to Europe, only $1,375,000, but a little more than the German Pacific line received and much less than Great Britain or France gave to a single one of their great steamship companies.

"It is manifest that this niggardly policy on the part of the United States not only discourages ship owning and ship building, but—far more important—hampers the efforts of American manufacturers, farmers, and merchants to gain their rightful share of the world's commerce. These great ocean mail lines of the powers of Europe all run direct from their own ports to the ports of the other continents. These powers spend no subsidies on lines from the United States. The European ships that engage in American trade with South America, Africa and the Orient are as a rule poor, slow, inefficient, uneconomical craft—the cast-off 'tramps' of European services. They are owned and managed by foreign companies, whose first concern is for the welfare of their own nation and for the profit of their main lines of communication. As the president of the British Peninsular and Oriental in a recent address boasted:

"Our policy is that of a British company which is keenly alive to British interests, and I believe in this respect we represent the general feeling of the ship owners of the country."

"The need of a large, active and prosperous merchant fleet is primarily to increase our commerce, next to promote the national defense, and last of all to encourage ship building and navigation.

"To deny adequate consideration to the merchant marine is to cheat our western or southern farmer of one of the surest hopes of an increased market for the products of his industry. It is to cheat the merchant and manufacturer of an indispensable ally in their fight for trade with their powerful European competitors.

"Britain, France, Germany all make generous provision by national subvention for conveying not only their mails but their merchandise under their national flags to the neutral distant markets. Even the smaller powers—Spain, Italy, Austria, Portugal, and last, but not least, Japan—do the same thing. The United States alone leaves its merchants, manufacturers, farmers at the edge of the ocean to get their goods over seas as best they may—by some accident of trade or the grace of their foreign rivals. If we lag in the world's markets, if we fall behind even in the Philippines, our own possessions, if we see Germany striding ahead of us in the Orient, and all Europe grasping South America by commercial bonds stronger than the Monroe Doctrine, the fault is our own, and in our own hands lies the remedy."

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THE PLEA OF CHEAPNESS.

Senator Gallinger replied at some length to the frequent objection urged against the policy of national encouragement to the merchant marine that "if foreigners will do this work more cheaply than we can do it ourselves, why not let them?" He said that "this plea critically examined is nothing but the fundamental free trade argument in the most extreme form in which it was possible to state it. Many years ago this was familiar in another field, and was urged against the development of our manufactures on the ground that Europe should be the workshop and America the farm. If the argument is a sound one that if foreigners can do or make anything more cheaply than we can, they ought to be permitted to do it or make it, then the entire protective system of the United States is rooted in delusion and ought to be abandoned.

"This plea applied to ships sounds very persuasive to the farmers of either Massachusetts or Minnesota, but if it is put in another form and the Massachusetts farmer is asked "If Canadians can supply butter and eggs, hay and potatoes more cheaply than you can, why not tear down the tariff wall and let them do so?" Or if the Minnesota farmer is asked "If Manitoba can raise wheat for the American market more cheaply than you can, why not repeal the protective duty of 25 cents per bushel and let Manitoba raise our wheat while you sell out and go to work for somebody else"—the public man who propounded this question in either Massachusetts or Minnesota would find himself a quick candidate for retirement. Yet, if the farmers, East and West, expect and demand national encouragement for their industry through the Department of Agriculture, through irrigation, and in many ways, as well as through the tariff, why should not the ship owner and the seaman in the deep sea trade have some encouragement also? If protection is wise and right for the one, why is it not wise and right for the other?

EXAMPLE OF THE LAKES.

"Moreover, it is worth considering whether, even if it is true that foreigners can now do our ocean carrying more cheaply than we, it would be true some years hence if this, our one unprotected industry, were adequately and firmly protected and encouraged. Our national experience from 1789 to 1860 proves that adequate protection to American shipping means in the long run not only as cheap ocean carrying but cheaper ocean carrying than foreign nations were providing. This is fortified by a striking development which has occurred in recent years on the great lakes of America. What is true of the steady reduction of cost in the lake trade is true also of the coastwise trade of the Atlantic and Pacific, from which the competition of foreign vessels is altogether excluded.

"It is estimated that the annual cost of transporting the exports and imports, the mails and the passengers in the over-seas trade of this country is about $200,000,000, nine-tenths of which goes to the pockets of foreign nations. If one-half of this immense yearly expenditure could be transferred to our own ships and seamen, the number of those ships and seamen would have to be multiplied five fold—benefiting not only the ship building and ship owning states, but all the states that furnish the timber, steel and other materials entering into ship construction, and creating an important new market for the product of American farms. At least 99 per cent of the total cost of a ship represents employment given to labor in the mines, the forests, the lumber mills, and the steel mills and foundries, as well as in the coast town where all these things are assembled in the finished vessel. The free trade argument involved in the question, 'If foreigners can build and sail our ships more cheaply, why not let them do so?' ignores these considerations altogether.

FOR THE NATIONAL DEFENSE.

"But there is another consideration which makes it wise for the United States to have an ocean shipping of its own—the need of ships and seamen for the national defense. One after another, of recent years, nearly all of the great ship yards of the United States capable of building first-class armorclads have gone into bankruptcy or escaped bankruptcy only by radical reorganization. It is an important fact that ship yards possessing the heavy machinery requisite for the construction of steel ships-of-the-line cannot be developed and maintained alone by the demand of the coastwise trade, whose vessels as a rule are of moderate power and dimensions. If the United States persists in its policy of neglecting its deep-sea shipping it will not be long before the ship building facilities of the country will have shrunk to what the coast trade can support, and in that case if great battleships are to be built in America at all, they must be constructed at the naval stations, with the very much increased cost which characterizes every such attempt to turn a private business over to the government.

"If we allow foreigners to do all our ocean carrying, we shall find ourselves without seamen, as well as without ships in a sudden emergency. American officers and sailors have so shrunk in numbers with the decline of our ocean tonnage that the United States navy—a significant likeness to Russia—has long been without the material for an efficient seagoing reserve, which England, France, Germany, Italy, and Japan have steadily regarded as of the very first importance.

"Foreigners with their cheap wages and subsidies may be willing and eager to convey our commerce in peace, but they will not fight our battles and defend our coasts in war. Indeed, as we learned in 1898, they will be likely to be found siding with our enemies, if they are not our enemies themselves."

NEW OCEAN MAIL LINES.

Senator Gallinger presented an analysis of the shipping bill stating that two distinct forms of encouragement and aid for ocean shipping were provided. One is in the form of new mail subventions to ten specified lines running, three of them from the Atlantic coast to Brazil, Argentina and South America resectively, four from ports of the Gulf of Mexico to Brazil, the Isthmus of Panama, Cuba and Mexico respectively, and three from the Pacific coast—one to Japan, China and the Philippines via Hawaii, one to Japan, China and the Philippines direct, and one to Mexico, Central America and the Isthmus of Panama. For these ten steamship lines—most of them entirely new services—the maximum compensation of $2,665,000 is proposed, distributed, $1,050,000 to the three Atlantic lines, $475,000 to the four Gulf of Mexico lines, and $1,140,000 to the three lines on the Pacific Ocean.

Besides these ten subventions, an amendment adds $250,000 to the present subvention of $757,000, payable under the Postal Aid law of 1891 to the American Line of mail steamers from New York to Southampton. Another amendment adds $217,000 to the $283,000 now paid under the act of 1891 to the Oceanic line of mail steamers from San Francisco to New Zealand and Australia. Steamships receiving these subventions must be built on plans approved by the navy department and must carry a naval reserve of officers and men of the sea militia, or naval volunteers. Annual retainers for these officers and men are provided according to their grade and value.

"The new mail subventions do not contemplate the building of any very fast steamers of the 'greyhound' class. The highest speed required on any of the new routes in this

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bill is 16 knots, the lowest 12 knots, yet this speed, while moderate, is somewhat superior to that of the foreign vessels now engaged in similar trades. It guarantees improved dispatch for the United States mails, and yet is easily attainable by modern ships having a great capacity for merchandise.

"DELIVERY WAGON" SHIPS.

"In the western and southern sections of the country there has been an earnest insistence on the value of what might be termed the 'delivery wagon' type of ship, the general cargo carrier especially adapted to transporting cotton, wheat, and other bulky articles that make up more than one-half of our exports to foreign lands. For all such vessels, steam or sail, the shipping bill provides a subvention of $5 per gross ton if engaged for a full year in the foreign trade, and for smaller sums for shorter periods. This is intended to equalize the cost of construction, wages, and maintenance between our own and similar foreign craft, and is conditional upon the employment in the crews of a certain proportion of naval volunteers, while the vessels accepting it must carry the mails when required free of charge, must be kept seaworthy and effective, must make all ordinary repairs in the United States, and be held ready to be taken by the government in time of war. The subvention is payable under a contract for one year at a time, renewable from year to year, but paid in no case to a given vessel for a longer period than ten years. The bill also postpones the application of the coastwise principle to our trade with the Philippines from July 1, 1906, until 1909, and offers in place of this a special subvention of $6.50 per ton to American vessels engaged in our commerce with the Philippines."

INCREASED TONNAGE TAXES.

Another section of the bill increases the present tonnage taxes, now lower in the United States than in any other nation. These increased tonnage taxes, it is estimated, will provide a net increase of revenue of $1,900,000 a year, more than paying all the cost of the subventions in the first year and turning a net gain of $616,000 into the treasury. In the second year of the bill, from July 1, 1907, to June 30, 1908, the commission's estimate is for a net cost of $1,667,000; for the third year, from July 1, 1908, to June 30, 1909 of $3,533,000; for the fourth year, $4,282,000; and for the tenth year, from July 1, 1915, to June 30, 1916, $7,682,000—an average of $4,625,625 a year. Great Britain and her colonies next year will be expending between six and seven million dollars on their merchant marine, France about eight million dollars and Italy and Japan between three and four million dollars.

RESULTS OF THE BILL.

Senator Gallinger summed up the results of the shipping bill as follows:

"1. A force of ten thousand naval volunteers, trained to the naval service.

"2. A new fleet of from 200,000 to 300,000 tons of steel mail steamships, a naval reserve of fast transports, ammunition ships, supply ships, auxiliaries, etc., in case of war.

"3. A new addition of 1,500,000 tons of cargo vessels, increasing four fold the actual ocean shipping of the United States.

"4. The creation of ten new and strengthened American steamship lines to South America, Central America, Africa and Asia, supplemented by a large and active fleet of 'tramp' or cargo vessels opening new markets and giving increased trade and employment for the whole American people impossible to set down in specific figures, but fifty fold or a hundred fold the entire cost of the national subventions."

Senator Gallinger said in closing:

"We have paltered with and postponed this question of American ocean trade for forty years. We have seen our shipping and our seamen vanish, and every nation grasping the trade that should have been our own. It must be acknowledged that the steady decline of our ocean shipping since 1861 marks the one great and humiliating failure of the Republican party. But the Republican party has failed here because here alone it has not been true to Republican principles. It has protected everything else that felt the pressure of foreign competition, but it has left unprotected the one industry that feels foreign competition most directly and keenly of all.

"Years ago, in 1881, in the last speech which Mr. Blaine delivered in the senate, he eloquently combated the proposition that this country should be dependent upon Great Britain for a merchant marine, and pointed to the fact that while congress had in the past twenty years passed 92 acts in aid of internal transportation by rail, giving 200,000,000 acres of public lands, worth today a thousand million dollars in money and added $70,000,,000 in cash, yet it had extended the aid of scarcely a single dollar to build up our foreign commerce.

"From that day to this," said Senator Gallinger in closing, "nothing has been done for American shipping except the enactment of the inadequate postal aid law of 1891, and we are now practically in the situation that Mr. Blaine so earnestly inveighed against, of dependence upon foreign nations in the matter of over-seas transportation. It is to rescue this country from the deplorable condition that today exists that this bill is offered to the congress. It does not go so far as I would wish, but its enactment will do something toward reviving the shipping interests of our country, and in a measure rehabilitating the American merchant marine, a result which all patriotic Americans desire to see accomplished."

LAUNCH OF THE JOSEPH SELLWOOD.

The steamer Joseph Sellwood, building for Capt. John Mitchell, of Cleveland, was launched from the Lorain yard of the American Ship Building Co., on Saturday last. The steamer was christened by Miss Larue Sellwood, daughter of Joseph Sellwood. In the launching party were Mr. and Mrs. L. W. Leithead and Mr. R. M. Sellwood, of Duluth; Miss Newton, Miss Dinkley, Mr. John Wedow, Miss Wedow, Miss Mitchell, Capt. and Mrs. John Mitchell, Ralph Mitchell, James Mitchell, Harry Mitchell, Capt. Richard Jackson, Capt. C. B. Galton, Wm. Fetting, John Scott, H. W. Herriman and A. B. Hambleton. Mr. Russel C. Wetmore and Mr. Owen Steele represented the ship building company. The Sellwood is 545 ft. over all, 525 ft. keel, 55 ft. beam and 31 ft. deep, and is equipped with triple expansion engines with cylinders 23½, 38 and 63 in. diameters by 42 in. stroke, supplied with steam from two Scotch boilers 14 ft. 2½ in. diameter and 11 ft. 6 in. long. She will be ready for service by the opening of navigation and will be commanded by Capt R. C. Jackson Jr. C. J. Love will be chief engineer.

Important changes are recommended in the report of the lighthouse board to the secretary of commerce and labor, in the conditions in Buffalo Harbor, Niagara river. Appropriations amounting to $25,000 are asked by the board to be expended, mainly in additional aids to navigation along the river, which is a dangerous one to navigate.

Capt. Henry Mills will look after the repair work on the steamers of the United States Transportation Co.'s fleet at Buffalo during the winter.

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THE LAKE TRADE.

Buffalo, Jan. 9.—The troubles of the vessel men consequent on having to lay up a fleet of 200 vessels, most of them of large size and more than a quarter of them loaded, are still on. The problem is much simplified in one respect from the absence of ice in the harbor, but there is all the same, a chance to exercise uneasiness that would not be possible if the ice was getting hard to navigate. The tugs have reaped a harvest from the state of things, and there will be more or less movement right along all winter at this rate, for the coal is not all loaded yet, though not much more is expected to go afloat, and there is a big rush for dry dock for winter repairs.

So the usual winter quiet promises to be modified considerably by work that is possible only in such a winter. It has been found impossible to lay up the grain cargoes with much reference to the elvators they are to unload at, though the disposition of them is better than last winter, when they had to be tied up two abreast a good deal. Now there is nothing of that sort permitted by the harbor master, so that if the ice does not get very heavy there will be some chance of moving even the big cargoes all winter.

Last winter the ice shut everything in so close that it was easy to settle the position of the fleet and elaborate blue prints, showing exactly where they all lay, were gotten out. At present it is said that there is no use trying such a scheme, as a vessel is here one week and there the next. It is also reported that the steel plant people are preparing to load a few cargoes of manufactured iron after a little, if the weather permits, so that with the unloading of vessels, that will go on all winter, and the moving in and out of dry dock there is promise of an amount of activity in the harbor that will be quite different from anything known here in winters before.

The rule used to be to let everything freeze in after the ice began to be heavy. It was a fine chance for the dwellers along the edge of the harbor, the fisherman and the like, for they could go where they liked on the ice. Then the harbor fire tugs began to multiply and they kept moving about the lower harbor, to keep open a channel to be used in case of fires, and semi-open harbor has been the rule of late.

Vessel men are much disturbed over the indifference of the city to harbor matters. But for the hard work done in the board of aldermen by some vessel agents there would not have been dredging enough done to make it possible to move the big fleet in the inner harbor this winter, or even to get them inside at all. Of late Chicago has shown some disposition to help out the poor fleet, which was giving it the go-by as much as possible, and there is hope still of Buffalo, though the traffic has grown very much faster than the harbor improvements have. The fact is that the changes in the status of the fleet have been so great of late that it has not been easy to keep pace with it.

What is to be the future of the fleet, anyhow? Is the individual vessel owner to survive, or will he soon be nothing more than at the best a stockholder in some fleet of one or more big craft? At present the problem is much dependent on the division of the ore interests. It is found that the vessel that is most sure of making money is the one that has two strings to pull, that is, has control of a lot of freight or something outside of itself. Then its season can be mapped out at the start and its earnings made a pretty sure thing. Men with capital to invest are advised to tie up to such ventures preferably to any other.

One thing suggested by this idea is the fact that the steel trust fleet is still considerably too small to handle the ore it controls, the estimate being 20,000,000 tons to carry and only about 11,000,000 tons carrying capacity, so that it is likely to add vessels right along till at least most of that extra freight is taken up, leaving the outside fleet to look for its ore elsewhere more and more. Still if there is 40,000,000 tons to move next season there is a good-sized margin left for some time yet, enough perhaps, to enable the lake steamer to settle down to some acceptable and permanent size, so that it is able to become something more than the mere experiment that it has always been.

Looking at the lake business on that plan, the instability of the fleet, the fast disappearance, both of type and individual vessel, the fluctuation of freight, the heavy competition from the railroads, the necessity of an enormous outlay of dock appliances, and it will have to be said that a great amount of ability has been shown to make sure of the big profits made. JOHN CHAMBERLIN.

ELECTRIC EQUIPMENT, MAJESTIC THEATER.

In the "souvenir" program issued for the opening week of the new Majestic Theater in Chicago, appears the following item:

"The electric light and power equipment in the Majestic theater building is one of the best and most modern private plants of its kind in the city. It was built and installed by the Allis-Chalmers Co., of Milwaukee, and consists of three generating units composed of Reynolds-Corliss engines, of the Reliance type, direct connected to Bullock direct current generators. Two of the engines are 20 in. by 26 in. producing 300 H. P. each; the third is 16 in. by 30 in. and of 150 H. P. The two larger engines are each connected to a Bullock direct current generator of 200 kilowatts capacity, while the smaller is coupled with a 100 kilowatt generator of the same make. There are two compensating sets, each consisting of a Bullock 45-kilowatt generator and a 15-kilowatt machine. This plant produces a 220 volt-power current and a 110-volt lighting current, distributed by the three-wire system through a seven-panel switchboard. The power is used for running the elevators, scene shifting machinery, compressed air plant, ventilating plant, etc., and furnishes the lighting current for all the building and the theater illumination."

The annual meeting of the Cleveland lodge of the Ship Master's Association was held last week, and the following officers elected: President, Henry T. Kelley; first vice president, A. H. McLachlan; second vice president, A. M. Williams; treasurer, Thomas Jones; secretary, Carlton Graves; delegate to the grand lodge, Henry T. Kelley; alternate, C. H. Woodford. The following officers were appointed by President Kelley: Chaplain, Robert Brooks; warden, Robert Thompson; marshal, Charles R. Cleveland; sentinel, A. Lelonde; Ralph D. Mitchell was elected an honorary member, and Capt. James Buchanan an active member.

Capt. C. B. Molles has purchased the schooner A. J. McBrier. Capt. Molles was in charge of dredging operations on the Saginaw river in the past season, and intends to install modern machinery and a pumping outfit and convert the schooner into a sand sucker for use on the Detroit and Saginaw rivers. The McBrier is 95 ft. long and 23 ft. beam, and was built in 1884.

The Drake Coal Co., Cleveland, O., has put out a very attractive calendar, reproducing in three color process Magine's painting entitled "Baby's Birthday." The colors of the original painting are well preserved in the reproduction.

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Winter Mooring List of Lake Vessels.

Name of Vessel.	Name and Address of Managing Owner.
Milwaukee, Wis.	
Str. Martin Mullen	Hutchinson & Co., Cleveland.
Str. City of Glasgow	Hutchinson & Co., Cleveland.
Schr. Abyssinia	Hutchinson & Co., Cleveland.
Str. Pascal P. Pratt	Lake Erie Transportation Co., Cleveland.
Green Bay, Wis.	
Str. Brazil	Wisconsin Transportation Co., Sheboygan, Wis.
Ashtabula, O.	
Bge. Porto Lapidum	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Sturgeon Bay, Wis.	
Str. Chas. B. Packard	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Str. Jos. L. Hurd	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Str. I. N. Foster	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Tug A. J. Wright	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Tug John Leatham	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis
Tug Geo. Nelson	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Bge. Advance	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Bge. M. Dohearty	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Bge Kellogg	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Bge. Pewaukee	Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.
Garden Island, Ont.	
Str. Simla	The Calvin Co., Garden Island, Ont.
Str. India	The Calvin Co., Garden Island, Ont
Str. D. D. Calvin	The Calvin Co., Garden Island, Ont.
Tug Chieftain III	The Calvin Co., Garden Island, Ont.
Tug Parthia	The Calvin Co., Garden Island, Ont.
Tug Frontenac	The Calvin Co., Garden Island, Ont.
Tug W. Johnston	The Calvin Co., Garden Island, Ont.
Bge. Burma	The Calvin Co., Garden Island, Ont.
Bge. Ceylon	The Calvin Co., Garden Island, Ont.
Benton Harbor, Mich.	
Str. City of Benton Harbor	Graham & Morton Transportation Co., Chicago.
Str. City of Chicago	Graham & Morton Transportation Co., Chicago.
Str. Holland	Graham & Morton Transportation Co., Chicago.
Str. Puritan	Graham & Morton Transportation Co., Chicago.
Str. P. M. No. 5	Graham & Morton Transportation Co., Chicago.
Tug Bonita	Graham & Morton Transportation Co., Chicago.
Ogdensburg, N. Y.	
Str. Nicaragua	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Str. Avon	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Tug Geo. D. Seymour	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Tug Myra	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Str. Denver	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Henry Witbeck	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Isaac Stephenson	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Fred Carney	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Menominee	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Hoboken	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. James Buckly	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. Ireland	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Bge. H. B.	Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.
Manitowoc, Wis.	
Str. Langham	Thomas Adams, Detroit, Mich.
Buffalo, N. Y.	
Str. John Stanton	Hutchinson & Co., Cleveland.
Str. William S. Mack	Lake Erie Transportation Co., Cleveland.
Str. P. P. Miller	J. E. Ball, Buffalo, N. Y.
Str. New Orleans	Capt. J. B. Hall, Buffalo, N. Y.
Str. Columbia	Capt. J. B. Hall, Buffalo, N. Y.
Str. Minneapolis	Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo, N. Y.
Str. St. Paul	Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo, N. Y.
Str. Huron	Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo, N. Y.
Str. W. Castle Rhodes	Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo, N. Y.
Str. Thos. Adams	Thomas Adams, Detroit, Mich.
Str. Geo. L. Craig	Thomas Adams, Detroit, Mich.
Str. Northern King	Mutual Transit Co., Buffalo, N. Y.
Str. Northern Queen	Mutual Transit Co., Buffalo, N. Y.
Str. North Wind	Mutual Transit Co., Buffalo, N. Y.
Str. Northern Light	Mutual Transit Co., Buffalo, N. Y.
Str. North Star	Mutual Transit Co., Buffalo, N. Y.
Str. William A. Rogers	Niagara Transit Co., North Tonawanda, N. Y.
Str. H. B. Hawgood	Henry A. Hawgood, Perry-Payne Bldg, Cleveland.
Str. Umbria	Henry A. Hawgood, Perry-Payne Bldg, Cleveland.
Sheboygan, Wis.	
Str. S. S. Curry	Henry A. Hawgood, Perry-Payne Bldg, Cleveland.
South Chicago, Ill.	
Str. Wisconsin	Henry A. Hawgood, Perry-Payne Bldg, Cleveland.
Detroit, Mich.	
Str. Victoria	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Excelsior	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Garland	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Sappho	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Promise	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Pleasure	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Columbia	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Pappoose	Detroit, Belle Isle & Windsor Ferry Co., Detroit.
Str. Gettysburg	Alger, Smith & Co., Detroit.
Chicago, Ill.	
Schr. Athens	Lake Erie Transportation Co., Cleveland.
Cleveland, O.	
Str. D. Leuty	Saginaw Bay Transportation Co., Cleveland.
Str. Rhoda Emily	Saginaw Bay Transportation Co., Cleveland.
Bge. R. Bottsford	Saginaw Bay Transportation Co., Cleveland.
Bge. Hattie	Saginaw Bay Transportation Co. Cleveland.
Schr. Emma C. Hutchinson	Hutchinson & Co., Cleveland.
Schr. Shawnee	J. N. Hahn, Cleveland.
Str. Jas. S. Shrigley	J. N. Hahn, Cleveland.
Saugatuck, Mich.	
Str. Saugatuck	Chicago, Saugatuck & Douglas Trans. Co., Saugatuck, Mich.
Duluth, Minn.	
Str. Joseph G. Butler Jr	Hutchinson & Co., Cleveland.
Str. Northern Wave	Mutual Transit Co., Buffalo, N. Y.

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Name of Vessel.	Name and Address of Managing Owner.
Toledo, O.	
Str. R. E. DoVille	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Str. Walter D.	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Str. Laura D.	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Str. Commerce	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Steamer Ella G.	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Str. Syracuse	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Str. D. Dussault	R. E. Doville, Sec., Lake Sand & Gravel Co., Toledo, O.
Lorain, O.	
Str. William A. Paine	Hutchinson & Co., Cleveland.
Str. J. T. Hutchinson	Hutchinson & Co., Cleveland.
Detroit, Mich.	
Str. Darius Cole	Star-Cole Line, Detroit, Mich.
Str. Idlewild	Star-Cole Line, Detroit, Mich.
Str. Arundell	Star-Cole Line, Detroit, Mich.
Str. Tempest No. 2	H. L. Wilton, Detroit, Mich.
Bge. C. G. King	H. L. Wilton, Detroit, Mich.
Str. Tionesta	Anchor Line, Buffalo, N. Y.
Str. Wm. G. Mather	Cleveland Cliffs Iron Co., Cleveland
Str. Peter White	Cleveland Cliffs Iron Co., Cleveland
Bge. F. L. Danforth	J. & T. Conlon, Thorold, Ont.
Schr. Marengo	MacArthur Bros. Co., Detroit, Mich.
Str. Tecumseh	MacArthur Bros. Co., Detroit, Mich.
Str. Emerald	Capt. A. T. May, Detroit, Mich.
Str. City of Detroit	Detroit & Cleveland Navigation Co., Detroit.
Str. City of Cleveland	Detroit & Cleveland Navigation Co., Detroit.
Str. City of Alpena	Detroit & Cleveland Navigation Co., Detroit.
Str. City of Mackinac	Detroit & Cleveland Navigation Co., Detroit.
Str. State of Ohio	Detroit & Cleveland Navigation Co., Detroit.
Str. City of the Straits	Detroit & Cleveland Navigation Co., Detroit.
Str. State of New York	Detroit & Cleveland Navigation Co., Detroit.
Str. Eastern States	Detroit & Buffalo Steamboat Co., Detroit.
Str. Western States	Detroit & Buffalo Steamboat Co., Detroit.
U. S. Mail Str. Florence B	C. F. Bielman, Detroit.
Str. Tashmoo	White Star Line, Detroit, Mich.
Str. Greyhound	White Star Line, Detroit, Mich.
Str. City of Toledo	White Star Line, Detroit, Mich.
Str. Owana	White Star Line, Detroit, Mich.
Str. Belle	G. A. Boekling, Sandusky, O.
Chicago, Ill.	
Bge. Halsted	J. A. Calbick & Co., Chicago, Ill.
Bge. Oak Leaf	J. A. Calbick & Co., Chicago, Ill.
Bge. R. L. Fryer	J. A. Calbick & Co., Chicago, Ill.
Str. John Oades	Michigan, Indiana & Illinois Line, Chicago.
Str. Normandie	Michigan, Indiana & Illinois Line, Chicago.
Bge. Frank C. Leighton	Michigan, Indiana & Illinois Line, Chicago.
Str. W. B. Morley	Wallace & Cunningham Transit Co., Dearborn, Mich.
Str. Ramapo	Union Steamboat Line, Buffalo
Str. Tioga	Union Steamboat Line, Buffalo
Str. Oswego	Union Steamboat Line, Buffalo
Buffalo, N. Y.	
Str. C. H. Bradley	O. W. Blodgett, Bay City, Mich.
Str. Zillah	O. W. Blodgett, Bay City, Mich.
Schr. Mary Woolson	O. W. Blodgett, Bay City, Mich.
Schr. Brightie	O. W. Blodgett, Bay City, Mich.
Schr. Nellie Redington	O. W. Blodgett, Bay City, Mich.
Str. C. Watson French	C. W. Elphicke & Co., Chicago, Ill.
Str. Pathfinder	Pickands, Mather & Co., Cleveland.
Bge. Sagamore	Pickands, Mather & Co., Cleveland.
Str. John B. Ketcham	H. N. Loud, Au Sable, Mich.
Str. City of Paris	S. P. Cranage, Bay City, Mich.
Str. Viking	F. W. Gilchrist, Alpena, Mich.
Str. Lyman C. Smith	U. S. Transportation Co., Cleveland.
Str. Monroe C. Smith	U. S. Transportation Co., Cleveland.
Str. Wilburt L. Smith	U. S. Transportation Co., Cleveland.
Str. H. S. Wilkenson	U. S. Transportation Co., Cleveland.
Str. Wm. Nottingham	U. S. Transportation Co., Cleveland.
Str. A. G. Brower	U. S. Transportation Co., Cleveland.
Str. Starrucca	Union Steamboat Line, Buffalo.
Str. Chemung	Union Steamboat Line, Buffalo.
Str. Binghamton	Union Steamboat Line, Buffalo.
Str. Rochester	Union Steamboat Line, Buffalo.
Str. New York	Union Steamboat Line, Buffalo.
Duluth, Minn.	
Bge. Corliss	Pittsburg Steamship Co., Cleveland.
Bge. Fritz	Pittsburg Steamship Co., Cleveland.
Bge. Holley	Pittsburg Steamship Co., Cleveland.
Bge. Manila	Pittsburg Steamship Co., Cleveland.
Bge. Nasmyth	Pittsburg Steamship Co., Cleveland.
Bge. Thomas	Pittsburg Steamship Co., Cleveland.
Bge. 117	Pittsburg Steamship Co., Cleveland.
Bge. 131	Pittsburg Steamship Co., Cleveland.
Bge. 134	Pittsburg Steamship Co., Cleveland.
Bge. 137	Pittsburg Steamship Co., Cleveland.
Str. Schuylkill	Anchor Line, Buffalo, N. Y.
Str Wissahickon	Anchor Line, Buffalo, N. Y.
Str. S. R. Kirby	Northwestern Trans. Co., Detroit.
Bge. George F. Hartnell	Northwestern Trans. Co., Detroit.
Str. W. D. Rees	Wilson Transit Line, Cleveland.
Str. Anna C. Minch	Kinsman Transit Co., Cleveland.
Bge. Constitution	Pickands, Mather & Co., Cleveland.
Str. Easton	United States & Dominion Trans. Co., Chicago.
Str. America	United States & Dominion Trans. Co., Chicago.
Str. Mabel Bradshaw	United States & Dominion Trans. Co., Chicago.
Str. Bon Ami	United States & Dominion Trans. Co., Chicago.
Str. C. W. Moore	U. S. Transportation Co., Cleveland.
B. Lyman Smith	United States & Dominion Trans.
Str S. C. Reynolds	Lake Erie Transportation Co., Toledo, O.
Toledo, O.	
Str. E. W. Oglebay	Gilchrist Transportation Co., Cleveland.
Bge. Oneonto	H. W. McCormick, Bay City, Mich.
Str. Cherokee	W. S. Brainard, Toledo, O.
Schr. Chippewa	W. S. Brainard, Toledo, O.
Str. Spokane	Wilson Transit Line, Cleveland.
Str. W. H. Gratwick	Mitchell & Co., Cleveland.
Str. C. M. Warner	U. S. Trans. Co., Cleveland.
Str George J. Gould	Lake Erie Trans. Co., Toledo, O.
Str. J. C. Gault	Lake Erie Trans. Co., Toledo, O.
Str. Russell Sage	Lake Erie Trans. Co., Toledo, O.
North Tonawanda, N. Y.	
Str. C. H. Green	John W. Robinson, North Tonawanda, N. Y.
Schr. Genoa	John W. Robinson, North Tonawanda, N. Y.
Schr. Our Son	John W. Robinson, North Tonawanda, N. Y.
Str. Schoolcraft	George Nester, Detroit, Mich.
Schr. Mary N. Bourke	George Nester, Detroit, Mich.
Schr. George Nester	George Nester, Detroit, Mich.
Str. Veronica	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Clyde	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Fleetwood	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Packer	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Oceanica	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Eddy	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Str. Curtis	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.

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Name of Vessel.	Name and Address of Managing Owner.
Str. Mercur	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Bge. Fassett	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Bge. Moravia	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Bge Pennington	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Schr. F. R. Buell	Tonawanda Barge Line, North Tonawanda, N. Y.
Schr. A. Weston	Tonawanda Barge Line, North Tonawanda, N. Y.
Bge. Eleanor	Tonawanda Barge Line, North Tonawanda, N. Y.
Bge. A. Stewart	Tonawanda Barge Line, North Tonawanda, N. Y.
Str. W. R. Stafford	Hope Trans. Co., Detroit, Mich.
Schr. Ed. McWilliams	Hope Trans. Co., Detroit, Mich.
Oswego, N. Y.	
Str. St. Joseph	N. Y., O. & W. Railway Co., Oswego, N. Y.
Str. Monteagle	Robert Downey & Co., Oswego.
Manistee, Mich.	
Bge. M. B. Corell	Gus. Kitzinger, Manistee, Mich.
Bge. John Shroeder	Gus. Kitzinger, Manistee, Mich.
Str. Pere Marquette No. 2	Gus. Kitzinger, Manistee, Mich.
Str. Pere Marquette No. 3	Gus. Kitzinger, Manistee, Mich.
Str. Pere Marquette No. 4	Gus. Kitzinger, Manistee, Mich.
Str. Wotan	Louis Sands Salt & Lumber Co., Manistee, Mich.
Str. Maggie Marshall	Louis Sands Salt & Lumber Co., Manistee, Mich.
Schr. Isabella Sands	Louis Sands Salt & Lumber Co., Manistee, Mich.
Schr. A. W. Luckey	Louis Sands Salt & Lumber Co., Manistee, Mich.
Schr. Arendal	Louis Sands Salt & Lumber Co., Manistee, Mich.
Bge. Robert C. Wente	Manistee Lumber Co., Manistee.
Str. Helen C.	John Smith, Manistee, Mich.
Str. Mark B. Covell	John Smith, Manistee, Mich.
Str. F. W. Fletcher	J. O. Nessen & Co., Manistee, Mich.
Str. Charles Rietz	J. O. Nessen & Co., Manistee, Mich.
Str. Manistee	J. O. Nessen & Co., Manistee, Mich.
Str. Albert Soper	J. O. Nessen & Co., Manistee, Mich.
Str. Missouri	Northern Michigan Transportation Co., Chicago.
Str. Illinois	Northern Michigan Transportation Co., Chicago.
Str. Kansas	Northern Michigan Transportation Co., Chicago.
Milwaukee, Wis.	
Str. Iroquois	W. C. Richardson, Cleveland.
Str. Iron King	W. C. Richardson, Cleveland.
Schr. Iron Queen	W. C. Richardson, Cleveland.
Str. Henry Steinbrenner	Kinsman Transit Co., Cleveland.
Str. Amazonas	James Davidson, West Bay City.
Str. Cartagena	James Davidson, West Bay City.
Str. Shenandoah	James Davidson, West Bay City.
Schr. Matanzas	James Davidson, West Bay City.
Str. Gogebic	Henry McMorran, Port Huron.
Bge. Santiago	Pickands, Mather & Co., Cleveland.
Str. J. W. Westcott	C. G. Forster, Milwaukee, Wis.
Schr. C. E. Wyman	C. G. Forster, Milwaukee, Wis.
Str Charles S. Neff	Charles S. Neff, Milwaukee, Wis.
Str. L. C. Smith	U. S. Trans. Co., Cleveland, O.
Str Hulbert W. Smith	U. S. Trans. Co., Cleveland, O.
Str. Orion	Green Bay Vessel Co., Green Bay.
Str. Fred Pabst	West Division Steamship Co., Chicago, Ill.
Str. Wm. H. Wolf	West Division Steamship Co., Chicago, Ill.
Bge. Armenia	West Division Steamship Co., Chicago, Ill.
Str. Marion	Michigan, Indiana & Illinois Line, Chicago.
Str. Minnie E. Kelton	Michigan, Indiana & Illinois Line, Chicago.
Str. A. E. Stewart	C. F. Bielman, Detroit, Mich.

Name of Vessel.	Name and Address of Managing Owner.
Manitowoc, Wis.	
Str. J. B. Cowle	U. S. Trans. Co., Cleveland.
Str. Argonaut	D. W. Mills, Cleveland.
Str. N. J. Nessen	J. O. Nessen & Co. Manistee, Mich.
Str. Raleigh	Henry Wineman, Jr., Detroit, Mich.
Str. Tampa	Henry Wineman, Jr., Detroit, Mich.
Str. City of Berlin	Henry Wineman, Jr., Detroit, Mich.
Bge. Tokio	Henry Wineman, Jr., Detroit, Mich.
Bge. Aurora	Henry Wineman, Jr., Detroit, Mich.
Green Bay, Wis.	
Str. Andrew Carnegie.	Wilson Transit Line, Cleveland.
Str. Fannie C. Hart	Green Bay Transportation Co., Green Bay, Wis.
Str. Eugene C. Hart	Green Bay Transportation Co., Green Bay, Wis.
Str. City of Green Bay	Green Bay Transportation Co., Green Bay, Wis.
Schr. Commodore	Knud Pederson, Buffalo, N. Y.
Port Huron, Mich.	
Schr. Favorite	H. E. Runnels, Port Huron, Mich.
Schr. E. E. Tyson	H. E. Runnels, Port Huron, Mich.
Str. Russia	Lake Transit Co., Buffalo, N. Y.
Str. Britannic	Henry McMorran, Port Huron.
Str. Mary Groh	Henry McMorran, Port Huron.
Str. Myrtie M. Ross	Henry McMorran, Port Huron.
Schr. Thomas H. Howland	Henry McMorran, Port Huron.
Str. W. W. Brown	U. S. Trans. Co., Cleveland.
Str. A. L. Hopkins	N. D. Carpenter, Detroit, Mich.
Str. W. D. Matthews	St. Lawrence & Chicago Steam Nav. Co., Toronto, Ont.
Ludington, Mich.	
Str. Pere Marquette 16	Pere Marquette Steamship Co., Milwaukee, Wis.
Benton Harbor, Mich.	
Str. Pere Marquette 5.	Pere Marquette Steamship Co., Milwaukee, Wis.
South Chicago, Ill.	
Str. J. C. Gilchrist	Gilchrist Trans. Co., Cleveland.
Str. J. L. Weeks	Gilchrist Trans. Co., Cleveland.
Str. D. M. Whitney	Gilchrist Trans. Co., Cleveland.
Str. Frick	Pittsburg Steamship Co., Cleveland.
Str. Gary	Pittsburg Steamship Co., Cleveland.
Str. German	Pittsburg Steamship Co., Cleveland.
Str. Perkins	Pittsburg Steamship Co., Cleveland.
Str. W. C. Richardson	W. C. Richardson, Cleveland.
Str. Panama	James Davidson, West Bay City.
Str. George B. Leonard	U. S. Trans. Co., Cleveland.
Str. S. M. Fischer	Lake Michigan Car Ferry Transportation Co., Chicago.
Str. J. C. Ames	Lake Michigan Car Ferry Transportation Co., Chicago.
Bge. Transport One	Lake Michigan Car Ferry Transportation Co., Chicago.
Bge. Transport Two	Lake Michigan Car Ferry Transportation Co., Chicago.
Str. Eastland	Michigan Steamship Co., Chicago.
Cleveland, O.	
Str. Victory	Pickands, Mather & Co., Cleveland.
Str. Aztec	Spence Bros., Cleveland.
Schr. Miztec	Spence Bros., Cleveland.
Schr. George B. Owen	Mitchell & Rowland Lumber Co., Toledo, O.
Schr. Allegheny	E. T. Garrington, Bay City, Mich.
Bay City, Mich.	
Str. Peshtigo	F. B. Chesbrough, Emerson, Mich.
Schr. Granada	James Davidson, West Bay City.
Str. Myron	O. W. Blodgett, Bay City, Mich.
Schr. Peshtigo	O. W. Blodgett, Bay City, Mich.
Schr. Delaware	O. W. Blodgett, Bay City, Mich.
Schr. B. W. Jenness	O. W. Blodgett, Bay City, Mich.
Str. Badger State	H. N. Loud, Au Sable, Mich.
Str. Kongo	H. N. Loud, Au Sable, Mich.
Str. J. P. Donaldson	W. H. Sharp, Bay City, Mich.
Bge. A. W. Wright	W. H. Sharp, Bay City, Mich.
Bge. Dayton	W. H. Sharp, Bay City, Mich.
Str. Maine	W. H. Sharp, Bay City, Mich.
Bge. Jackson	W. H. Sharp, Bay City, Mich.
Bge. J. L. Ketchum	W. H. Sharp, Bay City, Mich.
Superior, Wis.	
Str. Western Star	M. J. Cummings, Oswego, N. Y.
Str. Admiral	M. B. McMillan, Detroit, Mich.

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Name of Vessel.	Name and Address of Managing Owner.
Ogdensburg, N. Y.	
Str. Bermuda	James Davidson, West Bay City.
Str. H. R. James	Rutland Transit Co., Ogdensburg.
Str. W. J. Averell	Rutland Transit Co., Ogdensburg.
Str. J. R. Langdon	Rutland Transit Co., Ogdensburg.
Str. F. H. Prince	Rutland Transit Co., Ogdensburg.
Str. John C. Howard	George Hall Coal Co., Ogdensburg.
Str. Hecla	George Hall Coal Co., Ogdensburg.
Str. John Rugee	George Hall Coal Co., Ogdensburg.
Tug W. L. Proctor	George Hall Coal Co., Ogdensburg.
Tug Curlew	George Hall Coal Co., Ogdensburg.
Tug Mary P. Hall	George Hall Coal Co., Ogdensburg.
Schr. W. A. Sherman	George Hall Coal Co., Ogdensburg.
Schr. Bolivia	George Hall Coal Co., Ogdensburg.
Schr. E. P. Beals	George Hall Coal Co., Ogdensburg.
Schr. Jennie Matthews	George Hall Coal Co., Ogdensburg.
Schr. Mary Lyon	George Hall Coal Co., Ogdensburg.
Bge. Argosy	George Hall Coal Co., Ogdensburg.
Scow Ajax	George Hall Coal Co., Ogdensburg.
Str. Iron Duke	George Hall Coal Co., Ogensburg.
Marine City, Mich.	
Str. E. A. Shores Jr.	Lake Shore Saw Mill & Lumber Co., and The Cleveland Transit Co., Cleveland.
Str. Pawnee	Henry McMorran, Port Huron.
Schr. M. E. Orton	Henry McMorran, Port Huron.
Schr. J. P. Edwards	Henry McMorran, Port Huron.
Schr. Wm. A. Young	Henry McMorran, Port Huron.
Schr. Edward Kelly	H. N. Loud, Au Sable, Mich.
Str. Faustin	J. M. Shackett, Marine City, Mich.
Str. Havana	D. W. Mills, Cleveland.
Str. Sparta	D. W. Mills, Cleveland.
Schr. Biwabik	D. W. Mills, Cleveland.
Schr. Alex Anderson	D. W. Mills, Cleveland.
Marysville, Mich.	
Str. N. Mills	D. W. Mills, Cleveland.
Str. City of Concord	D. W. Mills, Cleveland.
Tonawanda, N. Y.	
Str. Sachem	Mitchell & Rowland Lumber Co., Toledo, O.
Ferrysburg, Mich.	
Str. Soo City	United States & Dominion Trans. Co., Chicago.
Alpena, Mich.	
Bge. Vinland	F. W. Gilchrist, Alpena, Mich.
Str. S. C. Hall	F. W. Gilchrist, Alpena, Mich.
Bge. Sam Flint	F. W. Gilchrist, Alpena, Mich.
St. Clair, Mich.	
Str. Benton	W. J. Willoughby, Goderich, Ont.
Str. Rube Richards	W. J. Willoughby, Goderich, Ont.
Bge. May Richards	W. J. Willoughby, Goderich, Ont.
Str. City of Holland	Oscoda & Cleveland Trans. Co., St. Clair, Mich.
Str. Pilgrim	Oscoda & Cleveland Trans. Co., St. Clair, Mich.
Str. Douglas	Oscoda & Cleveland Trans. Co., St. Clair, Mich.
Str. C. Hickox	Belknap & Phillips, St. Clair, Mich.
Str. Maud	Belknap & Phillips, St. Clair, Mich.
Muskegon, Mich.	
Str. Mathew Wilson	Muskegon Steam Barge Co., Muskegon, Mich.
Str. John Otis	Muskegon Steam Barge Co., Muskegon, Mich.
Str. George C. Markham	Thomas Monroe, Muskegon, Mich.
Schr. Lyman M. Davis	Thomas Monroe, Muskegon, Mich.
Str. Charles H. Hackley	Hackley Trans. Co., Chicago, Ill.
St. Ignace, Mich.	
Str. Islander	Arnold Transit Co., Mackinaw Island, Mich.
Str. Algomah	Island Trans. Co., St. Ignace, Mich.
Str Duluth	Island Trans. Co., St. Ignace, Mich.
Str. Waukon	Island Trans. Co., St. Ignace, Mich.
Cheboygan, Mich.	
Str. Chippewa	Arnold Transit Co., Mackinaw Island, Mich.
Str. Iroquois	Arnold Transit Co., Mackinaw Island, Mich.
Str. Elva	Arnold Transit Co., Mackinaw Island, Mich.
Michigan City, Ind.	
Str. O. E. Parks	O. E. Parks, Michigan City, Ind.

Name of Vessel.	Name and Address of Managing Owner.
Conneaut, O.	
Str. Fulton	Pittsburg Steamship Co., Cleveland.
Str. Gates	Pittsburg Steamship Co., Cleveland.
Str. Hill	Pittsburg Steamship Co., Cleveland.
Str. Linn	Pittsburg Steamship Co., Cleveland.
Str. Masaba	Pittsburg Steamship Co., Cleveland.
Str. Queen City	Pittsburg Steamship Co., Cleveland.
Str. Rensselaer	Pittsburg Steamship Co., Cleveland.
Str. Stephenson	Pittsburg Steamship Co., Cleveland.
Bge. Carrington	Pittsburg Steamship Co., Cleveland.
Bge. Martha	Pittsburg Steamship Co., Cleveland.
Bge. 130	Pittsburg Steamship Co., Cleveland.
Car Ferry Marquette & Bessemer No. 2	Marquette & Bessemer Dock & Navigation Co., Conneaut, O.
Str. Marquette & Bessemer No. 1	Marquette & Bessemer Dock & Navigation Co., Conneaut, O.
Lorain, O.	
Str. Poe	Pittsburg Steamship Co., Cleveland.
Str. Princeton	Pittsburg Steamship Co., Cleveland.
Bge. Magna	Pittsburg Steamship Co., Cleveland.
Bge. Maia	Pittsburg Steamship Co., Cleveland.
Bge. Marcia	Pittsburg Steamship Co., Cleveland.
Bge. Marsala	Pittsburg Steamship Co., Cleveland.
Bge. Roebling	Pittsburg Steamship Co., Cleveland.
Schr. Mary B. Mitchell	W. C. Richardson, Cleveland.
Str. James Gayley	Mitchell & Co., Cleveland.
Str. Walter Scranton	Mitchell & Co., Cleveland.
Str. W. E. Reis	Mitchell & Co., Cleveland.
Str. Mary C. Elphicke	C. W. Elphicke & Co., Chicago, Ill.
Str. W. L. Brown	C. W. Elphicke & Co., Chicago, Ill.
Str. Amasa Stone	Pickands, Mather & Co., Cleveland.
Grand Haven, Mich.	
Str. Three Brothers	James A. White, North Tonawanda.
Str. Pentland	W. H. Loutit, Grand Haven, Mich.
Escanaba, Mich.	
Str. George F. Williams	Gilchrist Trans. Co., Cleveland.
Str. Bulgaria	James Corrigan, Cleveland.
Bge. Iron Cliff	James Corrigan, Cleveland.
Schr. Chieftain	James Davidson, West Bay City.
Delray, Mich.	
Schr. Penobscot	Ohio Cooperage Transportation Co., Cleveland.
Str. Wm. Edwards	W. C. Richardson, Cleveland.
Schr. Golden Age	W. C. Richardson, Cleveland.
Schr. Paisley	James Davidson, West Bay City,
Sheboygan, Wis.	
Str. Orinoco	James Davidson, West Bay City, Mich.
Ashtabula, O.	
Str. Cort	Pittsburg Steamship Co., Cleveland.
Str. Mariska	Pittsburg Steamship Co., Cleveland.
Str. Mather	Pittsburg Steamship Co., Cleveland.
Str. Roman	Pittsburg Steamship Co., Cleveland.
Str. Trevor	Pittsburg Steamship Co., Cleveland.
Str. Iron Age	James Corrigan, Cleveland.
Bge. Ashland	James Corrigan, Cleveland.
Bge. M. W. Page	James Corrigan, Cleveland.
Str. L. C. Waldo	Roby Trans. Co., Detroit, Mich.
Str. Republic	Republic Iron Co., Cleveland.
Str. George A. Flagg	Calumet Trans. Co., Cleveland.
Str. R. S. Warner	Calumet Trans. Co., Cleveland.
Schr. S. D. Warriner	Calumet Trans. Co., Cleveland.
Schr. A. W. Thompson	Calumet Trans. Co., Cleveland.
Str. Philip Minch	Kinsman Transit Co., Cleveland.
Erie, Pa.	
Str. Briton	Pittsburg Steamship Co., Cleveland
Str. Corona	Pittsburg Steamship Co., Cleveland.
Str. Eads	Pittsburg Steamship Co., Cleveland.
Str. Grecian	Pittsburg Steamship Co., Cleveland.
Str. Griffin	Pittsburg Steamship Co., Cleveland.
Str. Maritana	Pittsburg Steamship Co., Cleveland.
Str. Maunaloa	Pittsburg Steamship Co., Cleveland.
Str. Wawatam	Pittsburg Steamship Co., Cleveland.
Bge. Krupp	Pittsburg Steamship Co., Cleveland.
Bge. Maida	Pittsburg Steamship Co., Cleveland.
Bge. Manda	Pittsburg Steamship Co., Cleveland.
Bge. Smeaton	Pittsburg Steamship Co., Cleveland.
Str. Italia	James Corrigan, Cleveland.
Str. Clarion	Anchor Line, Buffalo, N. Y.
Str. Alaska	Anchor Line, Buffalo, N. Y.
Str. Delaware	Anchor Line, Buffalo, N. Y.
Str. Codorus	Anchor Line, Buffalo, N. Y.
Str. Niagara	M. H. Taylor, Erie, Pa.
Schr. James Mowatt	J. W. Squires, Marine City, Mich.

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Name of Vessel.	Name and Address of Managing Owner.
Gladstone, Mich.	
Str. Castalia	Brown Steamship Co., Cleveland.
Ashland, Wis.	
Str. Vermillion	Gilchrist Trans. Co., Cleveland.
Bge. Bell	Pittsburg Steamship Co., Cleveland.
Washburn, Wis.	
Str. Aurania	James Corrigan, Cleveland.
Fairport, O.	
Str. LaSalle	Pittsburg Steamship Co., Cleveland.
Str. Maruba	Pittsburg Steamship Co., Cleveland.
Str. Wolvin	Pittsburg Steamship Co., Cleveland.
Bge. Jenney	Pittsburg Steamship Co., Cleveland.
Bge. David Moran	Kelley Island Lime & Trans. Co., Cleveland.
Algonac, Mich.	
Str. Wyoming	Kelley Island Lime & Trans. Co., Cleveland.
Str. A. Y. Gowen	Red Star Line, Buffalo, N. Y.
Houghton, Mich.	
Bge. Holland	Tonawanda Iron & Steel Co., North Tonawanda, N. Y.
Huron, O.	
Str. Hiawatha	Gilchrist Trans. Co., Cleveland.
Fishing Str. Stephen Chase	George Owen, Ashtabula, O.
Schr. M. I. Wilcox	C. C. Baumhardt, Vermillion, O.
Sault Ste. Marie, Mich.	
Bge. Tyrone	Gilchrist Trans. Co., Cleveland.
Chicago, Ill.	
Str. John H. Moore	F. M. Osborne, Cleveland.
Str. Rappahannock	James Davidson, West Bay City, Mich.
Schr. Montezuma	James Davidson, West Bay City.
Str. Phenix	C. W. Elphicke & Co, Chicago, Ill.
Str. Mueller	Wm. Mueller Co., Chicago, Ill.
Schr. Butcher Boy	Wm. Mueller Co., Chicago, Ill.
Schr. Richard Mott	Wm. Mueller Co., Chicago, Ill.
Str. C. F. Bielman	McLachlan Trans. Co., Port Huron,
Bge. Mary E. McLachlan	McLachlan Trans. Co., Port Huron,
Str. H. E. Runnells	Spence Bros., Cleveland.
Str. Niko	John J. Warde, Chicago, Ill.
Schr. Annie M. Peterson	John J. Warde, Chicago, Ill.
Str. Thomas Cranage	S. P. Cranage, Bay City, Mich.
Str. Arthur Orr	Canada Atlantic Trans. Co., Montreal, P. Q.
Str. Wm. H. Gratwick	U. S. Trans. Co., Cleveland.
Str. Gov. Smith	Rutland Transit Co., Ogdensburg, N. Y.
Str. A. McVittie	Rutland Transit Co., Ogdensburg, N. Y.
Str. W. A. Haskell	Rutland Transit Co., Ogdensburg, N. Y.
Schr. Ford River	Louis F. Drieske & Co., Chicago.
Str. Wm. P. Rend	W. P. Rend, Chicago, Ill.
Str. Panther	W. P. Rend, Chicago, Ill.
Str. Ravenscraig	R. J. Dunham, Chicago, Ill.
Str. City of London	R. J. Dunham, Chicago, Ill.
Str. Black Rock	R. J. Dunham, Chicago, Ill.
Str. P. J. Ralph	J. A. Calbick & Co., Chicago, Ill.
Str. J. H. Prentice	J. A. Calbick & Co., Chicago, Ill.
Str. Kalkaska	J. A. Calbick & Co., Chicago, Ill.
Bge. Harold	J. A. Calbick & Co., Chicago, Ill.
Bge. Connelly Bros.	J. A. Calbick & Co., Chicago, Ill.
Bge. Middlesex	J. A. Calbick & Co., Chicago, Ill.
Str City of Naples	Gilchrist Trans. Co., Cleveland.
Str. Cumberland	Gilchrist Trans. Co., Cleveland.
Str. Lansing	Gilchrist Trans. Co., Cleveland.
Str. Merrimac	Gilchrist Trans. Co., Cleveland.
Str. C. Tower	Gilchrist Trans. Co., Cleveland.
Str. Volunteer	Gilchrist Trans. Co., Cleveland.
Str. Wallula	Gilchrist Trans. Co., Cleveland.
Str. Niko	John Prindiville & Son, Chicago.
Bge. Paterson	John Prindiville & Son, Chicago.
Str. P. D. Armour	Arthur C. Helm, Chicago.
Str. W. M. Egan	Arthur C. Helm, Chicago.
Str. John Plankinton	Arthur C. Helm, Chicago.
Str. R. P. Fitzgerald	Arthur C. Helm, Chicago.
Str. Jesse H. Farwell	W. H. Follette, Tonawanda, N. Y.
Str. Bethlehem	Lehigh Valley Trans. Co., Buffalo.
Lighter Batavia	Lehigh Valley Trans. Co., Buffalo.
Str. Susquehanna	Anchor Line, Buffalo, N. Y.
Str. Lehigh	Anchor Line, Buffalo, N. Y.
Str. Charles Beatty	Volunteer Transit Co., Cleveland.
Str. J. H. Wade	W. C. Richardson, Cleveland.
Schr. Lake Forest	Capt. James Erickson, Milwaukee.
Schr. Hattie Hutt	Capt. James Erickson, Milwaukee.
Str. S. M. Clement	Mitchell & Co., Cleveland.
Str. F. H. Goodyear	Mitchell & Co., Cleveland.
Str. H. S. Holden	Mitchell & Co., Cleveland.
Str. Lagonda	Mitchell & Co., Cleveland.
Str J. J. McWilliams	Mitchell & Co., Cleveland.
Str. Major	Mitchell & Co., Cleveland.
Str. R. L. Fryer	Mitchell & Co., Cleveland.
Milwaukee, Wis.	
Str. Case	Gilchrist Trans. Co., Cleveland.
Str. Colonial	Gilchrist Trans. Co., Cleveland.
Bge. George	Gilchrist Trans. Co., Cleveland.
Str. John Harper	Gilchrist Trans. Co., Cleveland.
Str. Helena	Gilchrist Trans. Co., Cleveland.
Str. Massachusetts	Gilchrist Trans. Co., Cleveland.
Str. Mecosta	Gilchrist Trans. Co., Cleveland.
Bge. Magnetic	Gilchrist Trans. Co., Cleveland.
Str. Neosho	Gilchrist Trans. Co., Cleveland.
Str. Neshoto	Gilchrist Trans. Co., Cleveland.
Str. Alex. Nimick	Gilchrist Trans. Co., Cleveland.
Str. Olympia	Gilchrist Trans. Co., Cleveland.
Str. F. M. Osborne	Gilchrist Trans. Co., Cleveland.
Str. R. R. Rhodes	Gilchrist Trans. Co., Cleveland.
Str. H. S. Sill	Gilchrist Trans. Co., Cleveland.
Str. Tacoma	Gilchrist Trans. Co., Cleveland.
Str. Vulcan	Gilchrist Trans. Co., Cleveland.
Str. D. C. Whitney	Gilchrist Trans. Co., Cleveland.
Str. A. P. Wright	Gilchrist Trans. Co., Cleveland.
Str. Pere Marquette No. 4	Michigan Salt Trans. Co., Milwaukee, Wis.
Str. Gilbert	Pittsburg Steamship Co., Cleveland.
Str. Matoa	Pittsburg Steamship Co., Cleveland.
Str. Neilson	Pittsburg Steamship Co., Cleveland.
Str. A. E. Stewart	Stewart Trans. Co., Detroit, Mich.
Str. Progress	James Corrigan, Cleveland.
Str. Uganda	Edward Mehl, Erie, Pa.
Str. Harvey H. Brown	Northwestern Trans. Co., Detroit.
Str. Fayette Brown	Northwestern Trans. Co., Detroit.
Str. Henry W. Oliver	Wilson Transit Line, Cleveland.
Str. Yuma	Wilson Transit Line, Cleveland.
Cleveland, O.	
Bge. Antrim	Gilchrist Trans. Co., Cleveland.
Str. City of Genoa	Gilchrist Trans. Co., Cleveland.
Str. C. A. Eddy	Gilchrist Trans. Co., Cleveland.
Str. C. W. Elphicke	Gilchrist Trans. Co., Cleveland.
Str. R. L. Ireland	Gilchrist Trans. Co., Cleveland.
Str. E. N. Saunders	Gilchrist Trans. Co., Cleveland.
Bge. Twin Sisters	Gilchrist Trans Co., Cleveland.
Str. Winnebago	John Prindiville & Son, Chicago.
Str. Jesse Spalding	John Prindiville & Son, Chicago.
Str. A. G. Lindsay	S. W. Trans. Co., Cleveland.
Str. Bessemer	Pittsburg Steamship Co., Cleveland.
Str. Black	Pittsburg Steamship Co., Cleveland.
Str. Bunsen	Pittsburg Steamship Co., Cleveland.
Str. Colgate	Pittsburg Steamship Co., Cleveland.
Str. Coralia	Pittsburg Steamship Co., Cleveland.
Str. Corsica	Pittsburg Steamship Co., Cleveland.
Str. Joliet	Pittsburg Steamship Co., Cleveland.
Str. Palmer	Pittsburg Steamship Co., Cleveland.
Str. Zenich City	Pittsburg Steamship Co., Cleveland.
Bge. Malta	Pittsburg Steamship Co., Cleveland.
Bge. 118	Pittsburg Steamship Co., Cleveland.
Bge. 132	Pittsburg Steamship Co., Cleveland.
Bge. 133	Pittsburg Steamship Co., Cleveland.
Str. Monohansett	Ohio Cooperage Trans. Co., Cleveland.
Str. Alva S. Chisholm Jr.	Kelley Island Lime & Transport Co., Cleveland.
Tug W. B. Sanders	Kelley Island Lime & Transport Co., Cleveland.
Bge. James W. Pelten	Kelley Island Lime & Transport Co., Cleveland.
Bge. Norman Kelley	Kelley Island Lime & Transport Co., Cleveland.
Duluth, Minn.	
Str. Saturn	Gilchrist Trans. Co., Cleveland.
Str. Lewis Woodruff	Gilchrist Trans. Co., Cleveland.
Str. Cambria	Pittsburg Steamship Co., Cleveland.
Str. Corey	Pittsburg Steamship Co., Cleveland.
Str. Cornell	Pittsburg Steamship Co., Cleveland.
Str. Crescent City	Pittsburg Steamship Co., Cleveland.

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Name of Vessel.	Name and Address of Managing Owner.
Str. Edenborn	Pittsburg Steamship Co., Cleveland.
Str. Ellwood	Pittsburg Steamship Co., Cleveland.
Str. Empire City	Pittsburg Steamship Co., Cleveland.
Str. Ericsson	Pittsburg Steamship Co., Cleveland.
Str. Fairbairn	Pittsburg Steamship Co., Cleveland.
Str. Harvard	Pittsburg Steamship Co., Cleveland.
Str. Hounghton	Pittsburg Steamship Co., Cleveland.
Str. McDougall	Pittsburg Steamship Co., Cleveland.
Str. Malietoa	Pittsburg Steamship Co., Cleveland.
Str. Manola	Pittsburg Steamship Co., Cleveland.
Str. Maricopa	Pittsburg Steamship Co., Cleveland.
Str. Marina	Pittsburg Steamship Co., Cleveland.
Str. Mariposa	Pittsburg Steamship Co., Cleveland.
Str. Mataafa	Pittsburg Steamship Co., Cleveland.
Str. Morse	Pittsburg Steamship Co., Cleveland.
Str. Murphy	Pittsburg Steamship Co., Cleveland.
Str. Rockefeller	Pittsburg Steamship Co., Cleveland.
Str. Saxon	Pittsburg Steamship Co., Cleveland.
Str. Shaw	Pittsburg Steamship Co., Cleveland.
Str. Siemens	Pittsburg Steamship Co., Cleveland.
Str. Van Hise	Pittsburg Steamship Co., Cleveland.
Str. Watt	Pittsburg Steamship Co., Cleveland.
Bge. Bryn Mawr	Pittsburg Steamship Co., Cleveland.
Str. Superior City	Pittsburg Steamship Co., Cleveland.
Buffalo, N. Y.	
Str. Gilchrist	Gilchrist Trans. Co., Cleveland.
Str. F. W. Gilchrist	Gilchrist Trans. Co., Cleveland.
Str. C. C. Hand	Gilchrist Trans. Co., Cleveland.
Str. F. W. Hart	Gilchrist Trans. Co., Cleveland.
Str. F. J. Hecker	Gilchrist Trans. Co., Cleveland.
Str. Jupiter	Gilchrist Trans. Co., Cleveland.
Str. Lake Shore	Gilchrist Trans. Co., Cleveland.
Str. Mars	Gilchrist Trans. Co., Cleveland.
Str. Neptune	Gilchrist Trans. Co., Cleveland.
Str. George H. Russel	Gilchrist Trans. Co., Cleveland.
Str. R. E. Schuck	Gilchrist Trans. Co., Cleveland.
Str. Steel King	Gilchrist Trans. Co., Cleveland.
Str. Uranus	Gilchrist Trans. Co., Cleveland.
Str. Venus	Gilchrist Trans. Co., Cleveland.
Str. P. G. Walker	Gilchrist Trans. Co., Cleveland.
Str. C. W. Watson	Gilchrist Trans. Co., Cleveland.
Str. Lizzie Madden	M. J. Lynn, Bay City, Mich.
Str. Kensington	F. B. Chesbrough, Emerson, Mich.
Str. Panay	E. D. Carter, Erie, Pa.
Str. Luzon	E. D. Carter, Erie, Pa.
Str. Tuscarora	Lehigh Valley Trans. Co., Buffalo.
Str. Saranac	Lehigh Valley Trans. Co., Buffalo.
Str. Seneca	Lehigh Valley Trans. Co., Buffalo.
Str. Wilkesbarre	Lehigh Valley Trans. Co., Buffalo.
Str. Mauch Chunk	Lehigh Valley Trans. Co., Buffalo.
Str. Cuba	Red Star Line, Buffalo. N. Y.
Str. Robert Mills	Red Star Line, Buffalo. N. Y.
Str. Australia	James Corrigan, Cleveland.
Str. Caledonia	James Corrigan, Cleveland.
Cleveland, O.	
Str. Angeline	Cleveland Cliffs Iron Co., Cleveland.
Str. Presque Isle	Cleveland Cliffs Iron Co., Cleveland.
Str. Centurion	Cleveland Cliffs Iron Co., Cleveland.
Str. Pontiac	Cleveland Cliffs Iron Co., Cleveland.
Str. Frontenac	Cleveland Cliffs Iron Co., Cleveland.
Str. Cadillac	Cleveland Cliffs Iron Co., Cleveland.
Str. Pioneer	Cleveland Cliffs Iron Co., Cleveland.
Str. Andaste	Cleveland Cliffs Iron Co., Cleveland.
Str. Choctaw	Cleveland Cliffs Iron Co., Cleveland.
Str. Falcon	Cleveland Cliffs Iron Co., Cleveland.
Schr. Chattanooga	Cleveland Cliffs Iron Co., Cleveland.
Str. Arizona	Gray Transportation Co., Cleveland.
Bge. Scotia	Gray Transportation Co., Cleveland.
Bge. Plymouth	Gray Transportation Co., Cleveland.
Str. Capt. Thomas Wilson	Wilson Transit Line, Cleveland.
Str. Samuel Mitchell	W. C. Richardson, Cleveland.
Schr. Chicamauga	W. C. Richardson, Cleveland.
Str. Roumania	W. C. Richardson, Cleveland.
Str. J. J. Albright	Mitchell & Co., Cleveland.
Str. E. A. S. Clarke	Mitchell & Co., Cleveland.
Str. M. A. Hanna	Mitchell & Co., Cleveland.
Str. Louisiana	F. M. Osborne, Cleveland.
Str. City of Erie	Cleveland & Buffalo Trans. Co., Cleveland.
Str. City of Buffalo	Cleveland & Buffalo Trans. Co., Cleveland.
Str. Argo	Argo Steamship Co., Cleveland.
Bge. C. B. Jones	Argo Steamship Co., Cleveland.
Bge D. P. Dobbins	Argo Steamship Co., Cleveland.
Str. Mary A. McGregor	Potter, Teare & Co., Cleveland.
Schr. Grampian	James Davidson, West Bay City, Mich.
Buffalo, N. Y.	
Bge. Polynesia	James Corrigan, Cleveland.
Bge. Amazon	James Corrigan, Cleveland.
Str. India	Anchor Line, Buffalo, N. Y.
Str. Japan	Anchor Line, Buffalo, N. Y.
Str. Juniata	Anchor Line, Buffalo, N. Y.
Str. Mahoning	Anchor Line, Buffalo, N. Y.
Str. Conemaugh	Anchor Line, Buffalo, N. Y.
Str. Muncy	Anchor Line, Buffalo, N. Y.
Str. Mohegan	Holland & Graves, Buffalo, N. Y.
Schr. Mingoe	Holland & Graves, Buffalo, N. Y.
Schr. Aloha	Holland & Graves, Buffalo, N. Y.
Schr. Wilson	Holland & Graves, Buffalo, N. Y.
Schr. Francomb	Holland & Graves, Buffalo, N. Y.
Str. North West	Northern Steamship Co., Buffalo.
Str. North Land	Northern Steamship Co., Buffalo.
Str. Scranton	Lake Transit Co., Buffalo, N. Y.
Str. Lackawanna	Lake Transit Co., Buffalo, N. Y.
Str. F. B. Squire	Mack Steamship Co., Cleveland.
Str. Wm. Henry Mack	Mack Steamship Co., Cleveland.
Str. James P. Walsh	The Ohio Steamship Co., Cleveland.
Str. J. H. Devereaux	W. C. Richardson, Cleveland.
Str. Jim Sheriffs	J. W. Squires, Marine City, Mich.
Str. Moses Taylor	Mitchell & Co., Cleveland.
Str. Yale	R. R. Rhodes, Cleveland.
Str. W. C. Rhodes	R. R. Rhodes, Cleveland.
Str. Minneapolis	R. R. Rhodes, Cleveland.
Str. St. Paul	R. R. Rhodes, Cleveland.
Str. Huron	R. R. Rhodes, Cleveland.
Str. Venezuela	James Davidson, West Bay City, Mich.
Str. Sacramento	James Davidson, West Bay City, Mich.
Algonac, Mich.	
Str. Simon Langell	Comstock & Sinclair, Duluth.
Bge. W. K. Moore	Comstock & Sinclair, Duluth.
Bge. Interlaken	Comstock & Sinclair, Duluth.
Port Huron, Mich.	
Str. C. T. Flint	Comstock & Sinclair, Duluth.
Bge. Arenac	Comstock & Sinclair, Duluth.
Toledo, O.	
Str. Penobscot	Charles A. Eddy, Bay, City, Mich.
Milwaukee, Wis.	
Str. Maryland	Vance & Joys Co., Milwaukee, Wis.
Str. Manchester	Vance & Joys Co., Milwaukee, Wis.
Str. F. Schlesinger	Vance & Joys Co., Milwaukee, Wis.
Str. F. L. Vance	Vance & Joys Co., Milwaukee, Wis.
Str. R. P. Flower	Vance & Joys Co., Milwaukee, Wis.
Str. E. M. Peck	Frank W. Smith Milwaukee, Wis.
Str. Topeka	Frank W. Smith Milwaukee, Wis.
Str. Mary H. Byce	Frank W. Smith Milwaukee, Wis.
Str. Christopher	W. H. Meyer, Milwaukee, Wis.
Str. Lucy Neff	S. O. Neff Trans. Co., Milwaukee.
Str. Adella Shores	S. O. Neff Trans. Co., Milwaukee.
Str. City of Fremont	Barry Bros. Trans. Co., Chicago.
Str. Selwyn Eddy	Charles A. Eddy, Bay City, Mich.
Buffalo, N. Y.	
Str. Nyanza	James McBrier, Erie, Pa.
Str. Auburn	Western Transit Co., Buffalo, N. Y.
Str. Boston	Western Transit Co., Buffalo, N. Y.
Str. Buffalo	Western Transit Co., Buffalo, N. Y.
Str. Commodore	Western Transit Co., Buffalo, N. Y.
Str. Duluth	Western Transit Co., Buffalo, N. Y.
Str. Mohawk	Western Transit Co., Buffalo, N. Y.
Str. Rome	Western Transit Co., Buffalo, N. Y.
Str. Superior	Western Transit Co., Buffalo, N. Y.
Str. Syracuse	Western Transit Co., Buffalo, N. Y.
Str. Troy	Western Transit Co., Buffalo, N. Y.
Str. Utica	Western Transit Co., Buffalo, N. Y.

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Name of Vessel.	Name and Address of Managing Owner.
Str Yonkers	Western Transit Co., Buffalo, N. Y.
Bge. Teutonia	M. Sicken, Marine City, Mich.
Str. City of Bangor	Charles A. Eddy, Bay City, Mich.
Str. E. C. Pope	Charles A. Eddy, Bay City Mich.
Marine City, Mich.	
Str. Norwalk	Shoal Water Transportation Co., Mt. Clemens, Mich.
Bge. Thomas Gawn	M. Sicken, Marine City, Mich.
Bge. L. Rawson	M. Sicken, Marine City, Mich.
Bge. C. Spademan	M. Sicken, Marine City, Mich.
Bge. Grace Whitney	M. Sicken, Marine City, Mich.
Bge. Melvina	M. Sicken, Marine City, Mich.
Str. M. Sicken	M. Sicken, Marine City, Mich.
Bge. St. Joseph	M. Sicken, Marine City, Mich.
Tonawanda, N. Y.	
Str. George King	M. Sicken, Marine City, Mich.
Str. S. K. Martin	M. Sicken, Marine City, Mich.
Bge. D. Pendell	M. Sicken, Marine City, Mich.
South Chicago, Ill.	
Str. Manitou	Manitou Steamship Co., Chicago.
Detroit, Mich.	
Str. Frank E. Kirby	Ashley & Dustin, Detroit.
Chicago, Ill.	
Str. Wm. Livingstone	Wm. Livingstone, Detroit, Mich.
Str. L. Edward Hines	Edward Hines Lumber Co., Chicago, Ill.
Str. Trude R. Wiehe	Edward Hines Lumber Co., Chicago, Ill.
Str. Oscoda	Edward Hines Lumber Co., Chicago, Ill.
Str. Louis Pahlow	Edward Hines Lumber Co., Chicago, Ill.
Bge. Wayne	Edward Hines Lumber Co., Chicago, Ill.
Bge. Marvin	Edward Hines Lumber Co., Chicago, Ill.
Bge. Alice B. Norris	Edward Hines Lumber Co., Chicago, Ill.
Bge. Delta	Edward Hines Lumber Co., Chicago, Ill.
Bge. D. L. Filer	Edward Hines Lumber Co., Chicago, Ill.
Bge. Ida Corning	Edward Hines Lumber Co., Chicago, Ill.
Bge. Lizzie A. Law	Edward Hines Lumber Co., Chicago, Ill.
Bge. City of Chicago	Edward Hines Lumber Co., Chicago, Ill.
Str. Milwaukee	Western Transit Co., Buffalo
Str. Chicago	Western Transit Co., Buffalo
North Tonawanda, N. Y.	
Str. W. H. Sawyer	Edward Hines Lumber Co., Chicago, Ill.
Str. L. L. Barth	Edward Hines Lumber Co., Chicago, Ill.
Str. Cormorant	Edward Hines Lumber Co., Chicago, Ill.
Bge. A. C. Tuxbury	Edward Hines Lumber Co., Chicago, Ill.
Bge. C. E. Redfern	Edward Hines Lumber Co., Chicago, Ill.
Bge. Helvetia	Edward Hines Lumber Co., Chicago, Ill.
Bge. S. H. Foster	Edward Hines Lumber Co., Chicago, Ill.
Saginaw, Mich.	
Str. Robert Holland	Shannon & Garey, Saginaw, Mich.
Str. Homer Warren	Shannon & Garey, Saginaw, Mich.
Schr. Ida Keith	Shannon & Garey, Saginaw, Mich.
Schr. Exile	Shannon & Garey, Saginaw, Mich.
Schr. White & Friant	Shannon & Garey, Saginaw, Mich.
Schr. Wm. Crosthwaite	Shannon & Garey, Saginaw, Mich.
Schr. T. G. Lester	Shannon & Garey, Saginaw, Mich.
Schr. T. H. Cahoon	Shannon & Garey, Saginaw, Mich.
Schr. B. B. Buckhont	Shannon & Garey, Saginaw, Mich.
Ogdensburg, N. Y.	
Str. Pueblo	Frank W. Smith, Milwaukee, Wis.
Str. Omaha	Frank W. Smith, Milwaukee, Wis.
Cleveland, O.	
Str. John Owen	Owen Trans. Co., Detroit, Mich.
Mt. Clemens, Mich.	
Str. Mascott	G. A. Boekling, Sandusky, O.
Sandusky, O.	
Str. Thomas Maytham	Gilchrist Trans. Co., Cleveland.
Str. S. M. Stephenson	Muskegon Steam Barge Co., Muskegon, Mich.

Name of Vessel.	Name and Address of Managing Owner.
Schr. Keweenaw	George Nester, Detroit, Mich.
Str. Ionia	Ionia Trans. Co., Detroit, Mich.
Str. Norma	Kelley Island Lime & Transport Co., Cleveland.
Str. Annie Laura	C. McG. Koch, Sandusky, O.
Str. Mary H	John Homegardner Jr., Sandusky.
Schr. Crete	W. C. Richardson, Cleveland.
Str. Arrow	Sandusky & Islands & Sandusky & Peninsular S. S. Co., Sandusky.
Str. Lakeside	Sandusky & Islands & Sandusky & Peninsular S. S. Co., Sandusky
Str. R. B. Hayes	G. A. Boekling, Sandusky, O.
Str. A. Wehrle Jr.	G. A. Boekling, Sandusky, O.
Charlevoix, Mich.	
Str. Pine Lake	Charlevoix Lumber Co., Charlevoix, Mich.
Sheboygan, Wis.	
Str. Susie Chipman	Julius Kroos, Sheboygan, Wis.
Cleveland, O.	
Str. H. D. Coffinberry	Eugene M. Carleton, Cleveland.
Duluth, Minn.	
Str. G. J. Grammer	England Transit Co., Cleveland.
Str. R. W. England	England Transit Co., Cleveland.
Michigan City, Ind.	
Str. Francis Hinton	Marine Navigation Co., Michigan City, Ind.
Str. A. R. Colborn	Marine Navigation Co., Michigan City, Ind.
Algonac, Mich.	
Str. Wyoming	Port Huron & Duluth Steamship Co, Port Huron, Mich.
Str. Eda E	Charles Lonsby, Mt. Clemens, Mich.
Mt. Clemens, Mich.	
Str. Mascotte	Gilbert LaCroix, Mt. Clemins, Mich.
Str. Clinton	Charles Lonsby, Mt. Clemens, Mich.
St. Clair, Mich.	
Str. Edward P. Recor	E. C. Recor, St. Clair, Mich.
Str. Isabella J. Boyce	Capt. C. Pringle, St. Clair, Mich.
St. Ignace, Mich.	
Str. Algomah	Island Transportation Co., St. Ignace, Mich.
Str. Duluth	Island Transportation Co., St. Ignace, Mich.
Str. Wau-Kon	Island Transportation Co., St. Ignace, Mich.
Ogdensburg, N. Y.	
Str. Nipigon	Marine Transportation Co., Ogdensburg, N. Y.
Milwaukee, Wis.	
Str. Hilton	Charles H. Ellis, Care John Schroeder Lumber Co., Milwaukee, Wis.
Str. Hennepin	Lake Shore Stone Co., Milwaukee, Wis.
Bge. Emma E. Thompson	Kelley Lumber & Shingle Co., Traverse City, Mich.
Manitowoc, Wis.	
Tug Kate Williams	Lake Shore Stone Co., Milwaukee, Wis.
Buffalo, N. Y.	
Str. Augustus B. Wolvin	Acme Steamship Co., Duluth, Minn.
Duluth, Minn.	
Str. James C. Wallace	Acme Steamship Co., Duluth, Minn.
Port Huron, Mich.	
Str. Russia	Port Huron & Duluth Steamship Co., Port Huron, Mich.
Str. A. D. Hayward	Gilbert LaCroix, Mt. Clemens, Mich.
Chicago, Ill.	
Str. America	Charles Beyschleg, St. Clair, Mich.
Bay City, Mich.	
Bge. G. K. Jackson	Geo. D. Jackson, Bay City, Mich.
Port Dalhousie, Canada.	
Str. Persia	Merchant Line, Montreal, Canada.
Sombra, Ont.	
Bge. E. J. McVea	M. Sicken, Marine City, Mich.
Toronto, Ont.	
Str. Chippewa	Niagara River Day Line, Toronto.
Str. Corona	Niagara River Day Line, Toronto.
Str. Chicora	Niagara River Day Line, Toronto.
Str. Ongiara	Niagara River Day Line, Toronto.
Str. Cayuga	Niagara River Day Line, Toronto.
Str. Neepawah	R. O. & A. B. McKay, Hamilton.

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Name of Vessel.	Name and Address of Managing Owner.
Schr. St. Louis	Sylvester Bros., Toronto, Ont.
Str. Kingston	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Picton	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Toronto	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Saginaw	J. B. Miller, Toronto, Canada.
Str. City of Montreal	Merchant Line, Montreal, Canada.
Str. Cuba	Merchant Line, Montreal, Canada.
Boucherville, P. Q.	
Str. Varennes	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Boucherville	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Chicoutimi	Richelieu & Ontario Navigation Co., Montreal, Canada.
Sorel, P. Q.	
Str. Montreal	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Quebec	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. St. Irenee	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Murray Bay	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Tadousac	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Belleville	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Hamilton	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Prescott	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Brockville	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Cornwall	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Beaupre	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Berthier	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Terrebonne	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Chambly	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Three Rivers	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Mouche-a Feu	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Longueuil	Richelieu & Ontario Navigation Co., Montreal, Canada.
Str. Laprairie	Richelieu & Ontario Navigation Co., Montreal, Canada.
Owen Sound, Ont.	
Str. Theano	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Schr. John J. Barlum	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Str. Glenellah	R. O. & A. B. McKay, Hamilton, Ont.
Str. Algonquin	St. Lawrence & Chicago Steam Navigation Co., Toronto, Ont.
Str. Rosedale	St. Lawrence & Chicago Steam Navigation Co., Toronto, Ont.
Thorold, Welland Canal.	
Str. Iroquois	St. Lawrence & Chicago Steam Navigation Co., Toronto, Ont.
Fort William, Ont.	
Str. Madagascar	Bigelow Bros. & Walker Co., Chicago. Ill.
Sandwich, Ont.	
Bge. Sligo	W. J. Pulling, Windsor, Ont.
Windsor, Ont.	
Str. Juno	W. J. Pulling, Windsor, Ont.
Depot Harbor, Ont.	
Str. Kearsarge	Pickands, Mather & Co., Cleveland.
Str. George N. Orr	Canada Atlantic Trans. Co., Montreal, P. Q.
Str. Ottawa	Canada Atlantic Trans. Co., Montreal, P. Q.
Str. Kearsarge	Canada Atlantic Trans. Co., Montreal, P. Q.
Collingwood, Ont.	
Str. Strathcona	R. O. & A. B. McKay, Hamilton, Ont.

Name of Vessel.	Name and Address of Managing Owner.
Str. Caribou	United States & Dominion Trans. Co., Chicago.
Str. Manitou	United States & Dominion Trans. Co., Chicago.
Kingston, Ont.	
Str. Lake Michigan	R. O. & A. B. McKay, Hamilton, Ont.
Amherstburg, Ont.	
Str. Erin	J. & T. Conlon, Thorold, Ont.
Goderich, Ont.	
Str. Paliki	Algoma Central Steamship Co., Sault Ste. Marie, Ont.
Sault Ste. Marie, Ont.	
Str. Leafield	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Bge. Agawa	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Str. King Edward	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Str. Minnie M.	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Str. Ossifrage	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Tug Philadelphia	Algoma Central Steamship Line, Sault Ste. Marie, Ont.
Str. Merida	Gilchrist Transportation Co., Cleveland.
Midland, Ont.	
Str. Neebing	Canadian Northwest Steamship Co., Ltd., Port Arthur, Canada.
Str. Midland King	Midland Navigation Co., Ltd., Midland, Ont.
Str. Midland Queen	Midland Navigation Co., Ltd., Midland, Ont.
Tug Traveler	Midland Towing & Wrecking Co., Midland, Ont.
Tug Magnolia	Midland Towing & Wrecking Co., Midland, Ont.
Tug Reliance	Midland Towing & Wrecking Co., Midland, Ont.
Tug Metamora	Midland Towing & Wrecking Co., Midland, Ont.
Tug Minitaga	Midland Towing & Wrecking Co., Midland, Ont.
Tug Menodora	Midland Towing & Wrecking Co., Midland, Ont.
Str. Donnacona	R. O. & A. B. McKay, Hamilton, Ont.
Hamilton, Ont.	
Str. Arabian	J. R. Fairgrieve & Co., Hamilton, Ont.
Str. Wahcondah	R. O. & A. B. McKay, Hamilton, Ont.
Str. Golspie	R. O. & A. B. McKay, Hamilton, Ont.
Collingwood, Ont.	
Str. A. E. Ames	Canadian Lake & Ocean Navigation Co., Toronto, Ont.
Windsor, Ont.	
Str. H. M. Pellatt	Canadian Lake & Ocean Navigation Co., Toronto, Ont.
Owen Sound, Ont.	
Str. Turret Cape	Canadian Lake & Ocean Navigation Co., Toronto, Ont.
Goderich, Ont.	
Str. Turret Court	Canadian Lake & Ocean Navigation Co., Toronto, Can.
Str. Turret Chief	Canadian Lake & Ocean Navigation Co., Toronto, Can.
Brockville, Ont.	
Str. Samuel Marshall	Central Canada Coal Co., Ltd., Brockville, Ont.
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Str. J. H. Plummer	Canadian Lake & Ocean Navigation Co., Toronto, Ont.
Str. Midland King	Midland Navigation Co., Midland, Ont.
Str. Midland Queen	Midland Navigation Co., Midland, Ont.
St. Clair, Mich.	
Schr. Fannie Neil	J. U. Karr, Cleveland, O.
Schr. Donaldson	J. U. Karr, Cleveland, O.

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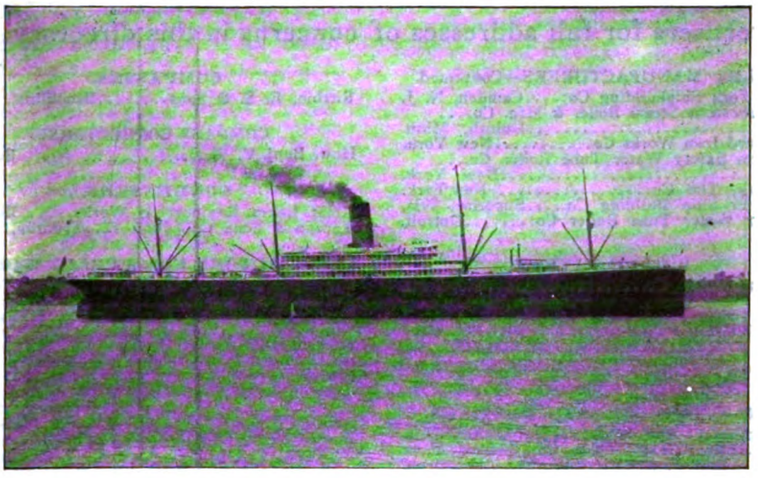

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See accompanying index of Advertisers for full addresses of concerns in this directory.

AIR COMPRESSORS, AIR HOISTS, ETC.
Great Lakes Engineering Works.....Detroit.
Mietz, Aug. .....New York.

AIR PORTS, DEAD LIGHTS, ETC.
Marine Mfg. & Supply Co.....New York.

AIR PUMPS AND APPLIANCES.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.

ANCHORS.
Bowers, L. M. & Co.....Binghamton, N. Y.

ANTI-FRICTION METALS.
Cramp, Wm. & Sons.....Philadelphia.

ARTIFICIAL DRAFT FOR BOILERS.
American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit
Great Lakes Engineering Works.....Detroit
Sturtevant, B. F., Co.....Hyde Park, Mass.

ASH EJECTORS.
Great Lakes Engineering Works.....Detroit.

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Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten.....Cleveland.
Hoyt, Dustin & Kelley.....Cleveland.
Jenkins, Russell & Eichelberger....Cleveland.
Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Shaw, Warren, Cady & Oakes.....Detroit.
White, Johnson, McCaslin & Cannon Cleveland

BAROMETERS, MARINE GLASSES, ETC.
Ritchie, E. S. & Sons.....Brookline, Mass.

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Republic Belting & Supply Co.....Cleveland.

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Cleveland Block Co.....Cleveland.

BLOWERS.
Power Specialty Co.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

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Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, David.....New York.
Lane & DeGroot....Long Island City, N. Y.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

BOILER CLEANING DEVICE.
Power Specialty Co.....Detroit.

BOILER COMPOUNDS.
The Bird-Archer Co..... New York
Dearborn Drug & Chemical Works....Chicago.

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American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Chicago Ship Building Co.....Chicago.
Cramp, Wm. & Sons.....Philadelphia.
Dearing Water Tube Boiler Co.....Detroit.
Detroit Ship Building Co.....Detroit.
East End Boiler Works.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Works.....
.....Oswego, N. Y.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co.....
.....Newport News, Va.

BOILER MANUFACTURERS—Continued.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co....
.....Duluth, Minn.
Quintard Iron Works Co.....New York.
Roberts Safety Water Tube Boiler Co....
.....New York.
Stirling, The Co..... New York.
Superior Ship Building Co.....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.

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Bourne-Fuller Co.....Cleveland.

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Falls Hollow Staybolt Co..Cuyahoga Falls, O.

BRASS AND BRONZE CASTINGS.
Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lunkenheimer Co.....Cincinnati.
Macbeth Iron Co.....Cleveland.

BRIDGES, BUILDERS OF.
Cowing, John P.....Cleveland.
Scherzer Rolling Lift Bridge Co.....Chicago.

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Brown Hoisting & Conveying Machine Co.
..... Cleveland.

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"Long Arm" System Co.....Cleveland.

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Martin-Barriss Co.....Cleveland.

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Upson-Walton Co.....Cleveland.
Republic Belting & Supply Co.....Cleveland.

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American Ship Windlass Co..Providence, R. I.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

CEMENT, IRON FOR REPAIRING LEAKS.
Smooth-On Mfg. Co.....Jersey City, N. J.

CHAINS.
Woodhouse Chain Works.....Trenton, N. J.

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Brown Hoisting Machinery Co. (Inc.)....
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General Electric Co.....Schenectady, N. Y.

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Boston & Lockport Block Co....Boston, Mass.

CHARTS.
Penton Publishing Co.....Cleveland.
Potter, J. D.....London.

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Ritchie, E. S. & Sons.....Brookline, Mass.

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Ironville Dock & Coal Co.....Toledo, O.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.

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Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.

COMPASSES.
Ritchie, E. S. & Sons.....Brookline, Mass.

COMPASS CORRECTORS.
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CONDENSERS.
Great Lakes Engineering Works.....Detroit.
Thropp & Sons Co., John E...Trenton, N. J.

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Upson-Walton Co.....Cleveland.

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Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.

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Brown Hoisting Machinery Co.....Cleveland.

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Morse, A. J. & Son.....Boston.
Schrader's Son, Inc., A..... New York.

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Sturtevant Co., B. F.....Hyde Park, Mass

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Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co.....Buffalo.
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Quintard Iron Works Co.....New York.

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Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
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Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.
Tietjen & Lang Dry Dock Co.....Hoboken, N. J

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Manitowoc Dry Dock Co.....Manitowoc, Wis.

DYNAMOS.
General Electric Co.....Schenectady, N. Y
Mietz, Aug.....New York.
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

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Sturtevant Co., B. F.....Hyde Park, Mass.

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WANTED and FOR SALE Department.

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PROPOSALS FOR TWO SNAGBOATS.—U. S. Engineer Office, Vicksburg, Miss., Jan. 8, 1906. Sealed proposals, in triplicate, for construction and delivery of two steel snagboats will be received here until 12 noon, standard time, March 10, 1906, and then publicly opened. Information furnished on application. G. M. Hoffman, Capt. Engineers

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Chase Machine Co.....Cleveland.
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Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co....Quincy, Mass.
Great Lakes Engineering Works.Detroit, Mich.
Hall Bros. .....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co...
..... Duluth, Mich.
Quintard Iron Works Co.....New York.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.

ENGINE BUILDERS, STEAM.

Sturtevant Co., B. F.....Hyde Park, Mass.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

ENGINEERING SPECIALTIES AND SUPPLIES.

Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Northwestern Steam Boiler & Mfg. Co...
..... Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Hynd, Alexander .....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph.....Duluth, Minn.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Roelker, H. B. .....New York.
Wood, W. J. .....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Hyde Park, Mass.

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Greacen-Derby Engineering Co.....
.....Perth Amboy, N. J.
Ross Valve Co.....Troy, N. Y.

FIRE EXTINGUISHERS.

Safety Fire Extinguisher Co.....New York.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.

FORGES.

Sturtevant, B. F. Co.....Boston.
Sutton Co., C. E.....Toledo, O.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co...Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Fix's, S. Sons.....Cleveland.

FUEL ECONOMIZERS.

Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.

GAUGES, STEAM AND VACUUM.

Lunkenheimer Co. .....Cincinnati.

GAUGES, WATER.

Bonner Co., Wm. T.....Boston.
Lunkenheimer Co. .....Cincinnati, O.

GENERATING SETS.

Sturtevant Co., B. F.....Hyde Park, Mass.
General Electric Co.....Schenectady, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J

GREASE EXTRACTORS.

Greacen-Derby Engineering Co.....
.....Perth Amboy, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.
Sutton Co., C. E.....Toledo, O.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....
.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug. .....New York.

HOLLOW SHAFTINGS, IRON OR STEEL.

Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAU. IC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INJECTORS.

American Injector Co.....Detroit.
Jenkins Bros. .....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON CASTINGS.

Sutton Co., C. E.....Toledo, O.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
Dreim, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson .....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
Walker & Sons, Thomas....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.

Lunkenheimer Co. .....Cincinnati

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
Hickler Bros.....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

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American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

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